Electrical
Contracting
February
1933
With Which Is Incorporated
The Electragist
1933
OPPORTUNITIES
for Contractors
REINSPECTION
The wiring in every other building is dangerously defective.
A nation-wide survey showed that in 6 out of every 10 buildings reinspection shows on the average a wiring job of $59.00.
If reinspection were enforced today in every city the volume of electrical work would amount to $992,000,000.

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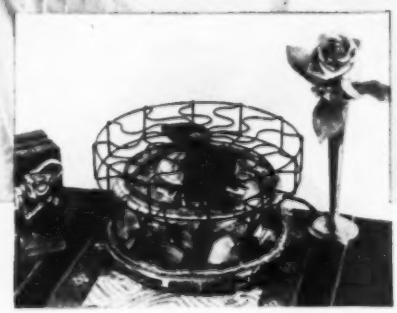
Bad Air...Odors...

AN UNTOUCHED GOLD MINE OF PROFITS



NOW an entirely new field—a gold mine of profits never touched before—is opened for you. Science has furnished the answer to several problems of civilized living never solved before. No longer need closed doors and windows in winter mean oppressive, lifeless air. No longer need repulsive odors of any sort be tolerated anywhere. *Ozone* . . . nature's own *vitalizing* and *purifying* gas . . . can now be generated at any 110-volt A. C. outlet.

O'zone, o'zon: *n. Chem.* A pungent gas regarded as an allotropic form of oxygen (O_3). A powerful oxidizing agent, being much more active than ordinary oxygen: employed for bleaching oils, waxes, ivory, flour and starch; also for sterilizing drinking water. — Funk & Wagnalls Dictionary.

Destroys Cooking Odors, Animal Smells, Stale Cigar Smoke—Any and All Odors in less than 15 Minutes in Average Room

So positive is the action of the Jefferson Ozonator, so spectacular its performance, that it instantly becomes the center of interest when demonstrated either in a home gathering or in the dealer's store. Even the most bitter skeptics are always amazed at the speed with which all kinds of odors are destroyed. Musty closets, rooms heavy with stale cigar smoke, the smell of fish, or boiled cabbage are all made clear and sweet *in a few minutes.* Even such penetrating odors as from medical bandages and animals are quickly overcome.

Purified and Vitalized Air Makes for Healthy Bodies and Alert Minds. Ozone destroys Germs.

Ozone, so powerful that it is used commercially for bleaching and for sterilizing is naturally a most dependable germ killer. Thus the Jefferson Ozonator is an effective aid in fighting colds, influenza, etc., and in making either homes or public places healthy and safe. Too, because it *vitalizes* the air—giving it that exhilarating freshness of the pine woods or mountain top, it keeps minds alert and bodies active.

JEFFERSON OZONATOR

Capitalize the Interest in Air Conditioning. Reap a Harvest of Profits Now in this Untouched, Waiting Market.

Products to sell in 1933 must have *novelty* appeal. They must be *different.* They must do something *never* done before. They must be demonstrable. They must be priced right. They must have a wide market. The Jefferson Ozonator is ALL of these *many times over.* "Where can I get one of those?" is the question everyone asks when they see it operate. Be sure your store is the answer. Write or wire for complete information NOW.

JEFFERSON ELECTRIC COMPANY
Bellwood (Suburb of Chicago) Illinois

The Jefferson Ozonator is of dignified and attractive design. It is arranged with key hole slot in back for hanging on wall and with rubber feet for standing on table or cabinet. The ozone tube generator and all electrical equipment are fully enclosed. The fan creates air movement to insure complete and even ozonation of any room. Operates on 110-volt *alternating current* and uses less current than a 25-watt lamp. Arranged with switch to adjust ozone discharge to conditions.

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VOLUME 32
NUMBER 4

electrical contracting

WITH WHICH IS INCORPORATED THE ELECTRAGIST
S. B. WILLIAMS, EDITOR AND GENERAL MANAGER

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Add this organization to your own

Above — Location of Wagner's 26 branch offices

At Left — The huge Wagner plant at St. Louis

by handling

Wagner Motors

When you take on the product of any manufacturer and program the expenditure of time, effort and money to develop sales for that product, you naturally give consideration to the staying qualities of that manufacturer. Perhaps you investigate the manufacturer's financial condition. All of this is good business.

Past performance is about the only yard stick by which you can measure the staying qualities of any manufacturer.

Wagner offers its record of forty years' service to the electrical industry as evidence of its staying qualities. In those forty years Wagner has built a national reputation and acceptance of its products. Wagner offers the cooperation of a nationwide organization, 26 branch offices, service stations and motor warehouses.

Wagner Electric Corporation
6413 Plymouth Avenue, Saint Louis, U.S.A.

MOTORS
TRANSFORMERS
Wagner Electric
FANS
BRAKES

Discounts

WITHIN the past few months a number of manufacturers have discussed with us the discounts which they should allow the contractor. In every case the manufacturer made it very clear that he was looking for the discount that would prove sufficiently attractive to the contractor to cause him to want to sell the device.

It used to be that a manufacturer would set his discount schedule on the basis of what he thought was right and then offer it to the trade. Today manufacturers are turning more strongly than ever to the contractor for business and they, therefore, are no longer willing to trust their own opinion—they want to hear from the field.

This is a fine step forward. It gives the contractor more courage to sell. It makes him feel that he will be compensated for his efforts.

MUCH of the cause for the complaint that contractors were not salesmen had its root in the discount schedule. If the things offered to him do not have any profit possibilities, he is going to turn them down not because he is a poor salesman, but because he is a good business man.

When the contractors complain about the margin on any line it is not because they are greedy it is simply that they want a chance to sell the line, and make a profit in so doing.

Might it not be well for manufacturers before setting discounts for the contractor to find out what it would cost them to sell direct. Then they might begin to have an idea of the contractor's sales cost and the reason why he must have a reasonable margin.

THE success of any industry, of any business, is based upon its ability to make a profit. When a manufacturer starts criticizing the electrical contractor for his poor selling, it is our suggestion that that manufacturer study his discount sheet and his own selling practices. Has he set up a margin large enough to permit selling? Has he set up a consumer discount that takes away most of the contractor's margin? Has he sent his own men in the field armed with discounts that make the contractor's customer buy direct?

Without increasing the volume of business, the industry has on many lines taken away the opportunity for the contractor to make a profit, while at the same time the sales cost has mounted.

Isn't it about time that manufacturers restudy their discount sheets and their sales costs? Many of them will find, in our opinion, that they can increase the contractors' margin, cut their own sales cost and make a better profit.

Contractors can and will sell when it is profitable, they will not sell when it is not profitable.

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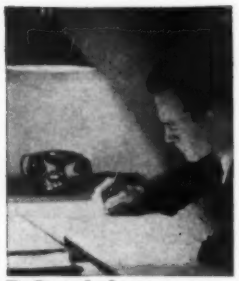
FIND NEW BUSINESS IN OLD BUILDINGS

Unbalanced



Reflected glare: *A constant annoyance to busy workers.*

Direct glare: *Resulting eye-strain retards production.*

Shadows: *Deep and sharp, instead of flat, "smooth" and subdued.*

Maintenance: *Complicated. Glass-changing should be easier.*

...Balanced Lighting can light the way to profitable remodelling jobs in 1933

Now's the time when enterprising contractors are out to sell re-lighting jobs. Older buildings are being remodelled to meet competition... And an installation of cheerful modern lighting—Balanced Lighting—can be the contractor's guiding light to 1933 electrical jobs.

Balanced Lighting implies the wisest selection of fixtures. It implies, too, the best application of lighting units to a given set of conditions. As this may require a partial or complete redistribution of the load—other profitable electrical work may follow.

There's a quick way to get going—Just sign the coupon below. With no obligation to you, it brings a Graybar lighting specialist who can recommend the most efficient, Balanced Lighting installation for any situation. And more, it brings you the opportunity to choose from the finest selection of fixtures and glassware available.

GraybaR

OFFICES IN 76 PRINCIPAL CITIES
EXECUTIVE OFFICES: GRAYBAR BLDG., N. Y.

Balanced Lighting

Vision is at its best when all the many variable lighting factors are "balanced."

Graybar Electric Co., Graybar Building, Lexington Avenue and 43rd Street, New York, N. Y. E.C. 2-33

Gentlemen: We are interested in knowing more about BALANCED LIGHTING.

NAME..... ADDRESS.....

VOLUME 32
NUMBER 4

electrical contracting

WITH WHICH IS INCORPORATED THE ELECTRAGIST

FEBRUARY
1933

Fer-de-Bras

BY JOHN WISE

AWAY back in England's Feudal Era, lived a certain 10-minute egg with a genius for organization. He was Count Roland Fer-de-Bras, which means "arms of steel," and from the pennon that fluttered above his castle down to the youngest stable-boy, everything and everybody clicked like a railroad watch. His position was so strong and his boys so tough that nobody dared bother him, not even the King.

Now, Fer-de-Bras' domain was surrounded by a bunch of lesser nobles, who lived in peace only because of his rep as a battler. So, to make security certain, he invited them all to join his organization and kick in with nominal dues, as he had heavy overhead and it was only right they should share the expense.

However, things had been so quiet around there the boys just couldn't see why they should belong, so they gave some swell excuses and let it ride. Of course, the Count could have made them come across, but he didn't play that way—he wanted them to come in gladly or not at all.

One morning, a little later, Fer-de-Bras heard a clatter of hoofs and got out of his warm bed to receive a delegation of white-faced neighbors. "It's Arnold the Axe!" they yelped. "A bad hombre if there ever was one, they call him the Scourge of Devon. He's wise to our fat cattle and socks full of dough, and he's only four hours' march away with a thousand men. Have a heart, Rollie, and let us in your castle, you got room."

"Sure, I got room," says the Count, "Also I still got that heavy overhead I told you about. Come in, but bring your dues with you."

Say, they almost broke the goose quills signing up! Then, to show he was 100 per cent regular, Fer-de-Bras didn't wait for their cattle to be gobbled and their crops burned. Instead, he hid his fighters in a grove at the foot of the hill, and when the Scourge of Devon arrived he was taken to the cleaners for half his men.

I'm not saying that we contractors don't know the value of organization, but we have a very bad habit of staying out or dropping out for no good reasons. But when greedy and unscrupulous outside forces threaten our daily bread, we rise on our hind legs and demand protection from associations which we have not supported.

The thing to do is to get in and stay in. With full membership and plenty of money, your organization can learn in advance when danger looms, and fight it effectively when the attack materializes.

Join and stay put—it always pays.

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How

Concentric Wiring

is Being Installed

LAST summer it was reported that five Edison companies located in Baltimore, Boston, Cleveland, Detroit and St. Louis, were each going to install two hundred concentric wiring jobs, although this method of wiring is not recognized in the National Electrical Code or any of the city Codes. To date the work has not progressed with the rapidity that these power companies had expected it would. In some cities no further installations of this kind will be made until the National Electrical Code recognizes the method and sets up rules governing its installation.

More jobs have been installed in Detroit than in any other city and to date less than twenty have been installed there.

The materials in the system are composed of a concentric cable and a box of Bakelite, or similar material, that is held in an iron frame with two brackets.

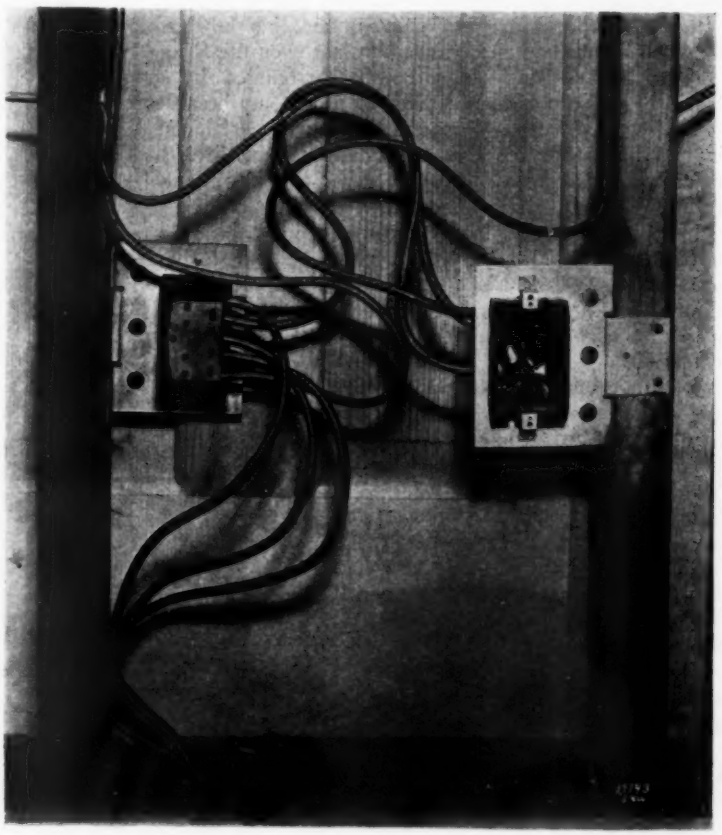
The concentric cable consists of an ordinary insulated No. 14, or No. 12 wire around which is wound spirally a bare wire of 20 strands. About these is wound a thin narrow metal strip having about 16 wraps to the inch.

The assembled cable is about ¼ in. in diameter or the size of an ordinary lead pencil.

In Detroit all outlets on the job have the same size outlet boxes, which are the size of a single switch box, 1⅝ in. wide, 2⅝ in. long and 2¾ in. deep. These are used for convenience outlets, ceiling and bracket outlets, 1, 2 or 3-gang switch outlets and 3-circuit panelboard outlets.

The only support for either a ceiling or a bracket fixture would be two No. 6/32 screws, as they are supported on a strip across the outlet box.

Up to the present time, as can be seen from the accompanying photographs, the installing of the work presents certain problems from the standpoint of neatness.



Rear view (left) of a convenience outlet with 10 wires in it. One wonders how much room will be left in the box after all joints have been properly made. At the right is a front view of another box. The bottom, or back, of this box is a removable iron plate held in place by a small iron clamp on one side and by the wire on the other. On this plate are mounted the contacts for the grounded wire. Although the grounded wire is stranded no lugs are used for connection to this grounding strip.

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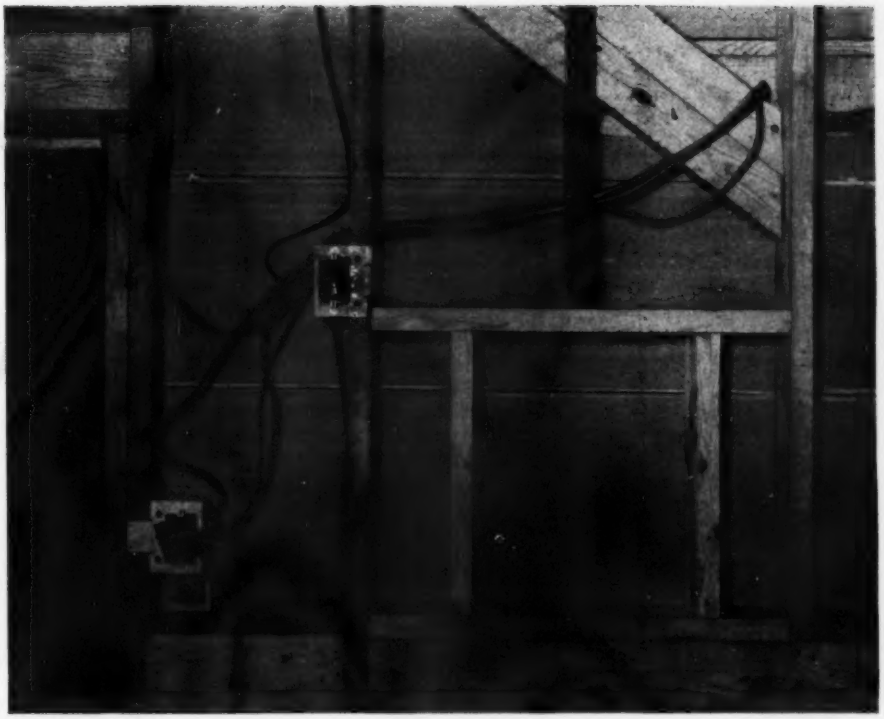

At the lower left will be seen a connection plate before it has been put in place.

It is doubtful if any reliable cost figures can be developed from the work now going on. The concentric cable costs approximately the same as armored cable or non-metallic sheathed cable and more than wire, and porcelain for a knob and tube job. Unlike the other materials this new material does not at present have any selling or overhead charges included in the price.

A glance at the photographs, coupled with a knowledge of the material, causes one to question any claim of a saving in labor. On the other hand, the prices at which this work is being installed in Detroit are ridiculously low. One job of 90 outlets, for instance, was contracted for at $75.00, the price including service and everything complete.

A 9-circuit panel. Three of the same size boxes are used as on each of the outlets shown in the other illustrations.

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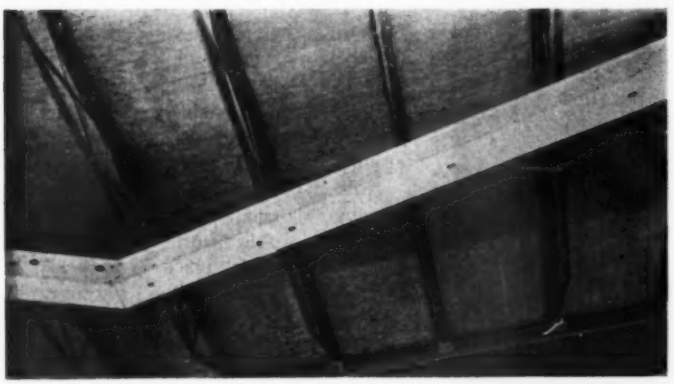
World's Fair Wiring

Feeders are run in a 5-in. square raceway of 18 gauge galvanized sheet metal. This illustration shows feeder from transformer vault tying in with a run of approximately 500 ft. of trough. The cut-out boxes are seen mounted on both sides. The trough is suspended from the ceiling by bolts which go through the raceway as shown at the open end.

Because of their temporary nature, the buildings of the 1933 Chicago World's Fair—A Century of Progress Exposition—are being wired in a manner especially designed to give economy, safety, flexibility and ease of installation.

The feeders are run in a light weight galvanized metal trough, attached to which are cut-out boxes from which the branch circuits are run. The latter are run in conduit for the fixed overhead building lighting. Exhibitors' lighting and pillar lighting are served by open cleat circuits.



The bottom part of the raceway came factory punched at definite intervals for the insertion of the bolt with which the trough is attached to the ceiling framework.

End view of 5-in. raceway with cover snapped on illustrating the method of placing the cable in layers with asbestos sheets between. As many as 16 No. 00 cables can be laid in a single raceway in this fashion.

Offsets were made by cutting the ends of the raceway to the desired angles and then bolting the ends together with patches of sheet metal.

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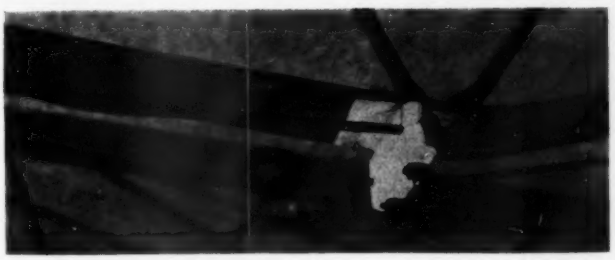
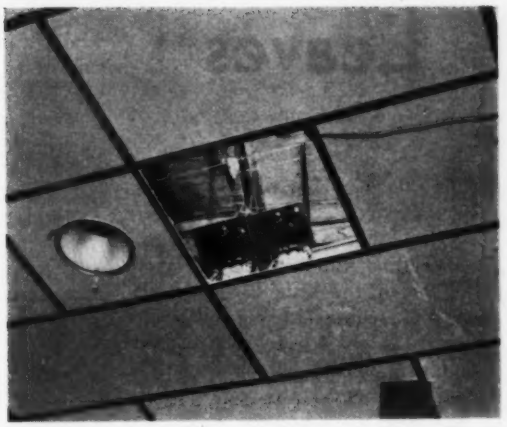
Close-up illustrating the method used for mounting fuse boxes. The 1-in. round holes with the three small holes shown at definite intervals on the side of the raceway are punched on both sides and are used for attaching the fuse box and porcelain block to the raceway with the use of three small bolts and a 1-in. nipple and locknut through which the two No. 4 connecting wires are brought in.

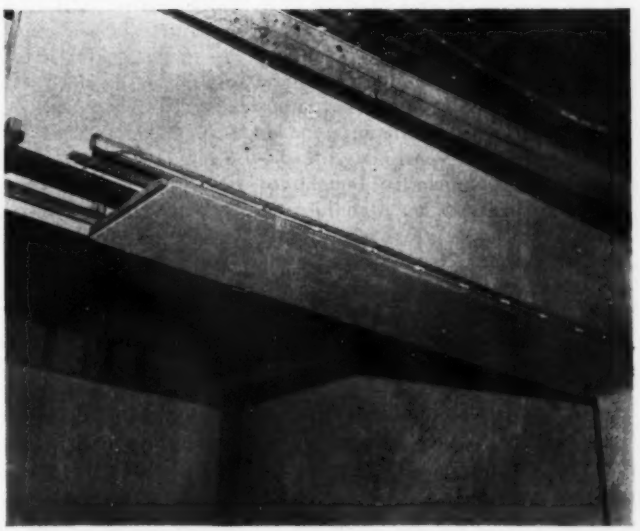


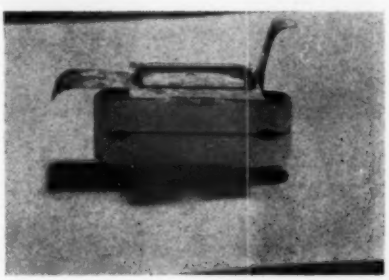
Branch circuits of No. 12 wire are run exposed parallel with the steel ceiling joists on cleats.



After the thin wallboard ceiling is installed a marked panel is left unfastened which can be easily removed, permitting easy accessibility to all fuse boxes.

For exhibit signs and corridor lighting a 2 by $1\frac{1}{2}$ in. raceway, 26 gauge sheet metal, punched for sign type sockets is used. It comes in 10-ft. lengths and is assembled on the bench. The cover is not snapped on until it is fastened to the framework in sections and the ends of the wires spliced. The illustration shows it fastened to a corridor panel for indirect lighting.





The porcelain cleats are assembled at the bench into a unit which can be easily attached to steel ceiling joists. A stamped and formed piece of galvanized sheet metal holds the cleat to the joist. A threaded U bolt is used to tighten up with.

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What the Other Fellow Leaves

"FIFTY per cent of my business today comes from jobs where the other fellow is through." This startling statement coming from E. D. Faeh of the Acme Electric Company, Pasadena, Cal., was not in the nature of a boast. He had just got through saying that on so many occasions had he gone into homes where he had done work himself within the last year or two, and found so much wiring and so many electrical conveniences that had been added since he left there, that it had made him sick to his stomach. The point is, that he learned the lesson of loss that comes through only partially selling a job and set out to train himself in more thorough selling methods.

While he was talking a woman, apparently wealthy, came in to get some adapters and low-wattage fancy lamps —a couple of dozen adapters and as many lamps. It seems that the fixtures that this woman had bought for her home were not adapted to this type of lamp which she now wished to use in certain colors, to conform to the decorations, and she had called in Mr. Faeh the day before to tell her how to get the result she was after. This was after the contractor who had installed the fixtures had told her that nothing could be done about it.

"In so far as the lamps and adapters go," said Mr. Faeh, "that order does not amount to a great deal. But the customer now looks upon me as someone who can understand her electrical problems and give her results, and with this class of customer that is all the contractor should need as an entering wedge."

Some of his experiences along this line are quite interesting. This last year he says that he has had only one job in a building where he did not succeed in completely electrifying it.

One high class shop wanted to have the benefit of night advertising that comes from a highly illuminated interior after business hours, and wanted it so that passers-by might have an unobstructed view. He thought up the idea for them of having a solid glass door which could be raised and lowered by ordinary elevator mechanism, and turn the doorway into a plate glass window at night. He designed the whole thing and installed it, for the sum of $4,000, which compares quite well with the $600 that had been paid to another contractor for wiring the building itself. And yet it was only an idea for an extra—something the other fellow left.

Another wealthy party who had a supposedly complete home from an electrical standpoint, found out through this enterprising contractor that it was not so complete after all. The man had trouble going to sleep some nights, until a late hour. Then of course he wanted to sleep late in the morning, if it so happened that he did not get to sleep until two or three a.m. If he got a good night's rest he was up early, but if not, then he wanted to get up after the sun was pretty high. This, of course, made it a little difficult to leave calls, and being more or less of a bug on mechanical contrivances he called Faeh in to help him out.

A lesson in selling adequacy

The waking up, in case he had a bad night, was accomplished by means of a photo cell arrangement, which, the sun, when it got to the proper height, would actuate thereby setting in motion the motor-driven mechanism which would raise the venetian blind.

This pleased him, whereupon the contractor was there with many more ideas, finally billing out about $4,000 for the work that the other fellow had left.

Another one of the "villagers" had an addition put onto his house. In this case Faeh was first on the job and did the wiring for $215. Once in there, he managed to get started on the rest of the house through demonstration of a particular type of heater. Then from that point his "ideas" burst forth one after another, with the result that the whole house was completely electrified to the tune of $2,600.

"And," said Mr. Faeh, "don't think this customer did not talk hard times like the rest of us. Step by step he had to be sold, and the argument that is the strongest in my opinion is not how cheap, but that the best is not good enough. To get this over you must be in contact with the owner himself. While I contact and work with the architects, you never can go far enough with them in the way of complete electrification. In the case of all important jobs where I am working with an architect, I always find some bone of contention—something not 'clear' in the specifications—that makes it necessary to 'talk things over' with the owner."

E. D. FAEH

Adequate Wiring Promotion

By Arthur L. Abbott

THE time is ripe in almost every city for making comprehensive plans for creating new electrical business. Some may prefer the term electrical development, or market development, or sales promotion, or electrical modernization. The writer prefers Promotion of Adequate Wiring because adequate wiring is the hub of the wheel, the central supporting member from which radiate the spokes of better lighting, appliance sales, modernization of power equipment and increased sales of kilowatt-hours.

Sales of everything the electrical industry has to offer the public will inevitably follow the sale of adequate wiring. Quite possibly it may be found that in certain cases the best form of approach to the public is a special campaign to sell lighting equipment or some special class of appliance or equipment. If such a plan appears to hold out the best possibilities of success, all well and good; let us by all means make use of the most effective methods, but let us not lose sight of our real objective, which is to furnish to the public all the electrical service that the public needs, and let us not forget that this complete electrical service can only be furnished to the occupant of an adequately wired building.

Even now, some residential building is in progress and all of these houses and apartments should be adequately wired. Reports from many parts of the country indicate a long-existing need for additional outlets in homes, a need that the industry has never met intelligently.

While there is much vacant residential property, it is a matter of common knowledge that this is due to the many cases where two, or more, families are crowded into a single apartment. We also know that the number of families is increasing and that consequently an actual shortage of living quarters is being built up which must sooner or later result in a considerable amount of residential construction.

ARTHUR L. ABBOTT

Vacant commercial property is in evidence everywhere. When we do start on the up grade, the wiring in nearly all of these buildings will be found to be unsuitable for the use of the new tenants, and will have to be repaired or replaced. Industrial plants are rapidly becoming obsolete through disuse, lack of maintenance and the development of new processes, machinery and methods and an enormous amount of new wiring power and lighting equipment will be needed when the wheels of industry again begin to turn.

If we are to be prepared for the upturn when it comes, we must begin organizing and planning for promotional work right now.

The plan to be outlined here is built upon these two principles:

1. The purpose of every business organization is to make a profit.
2. Each group in the electrical industry—utilities, manufacturers, wholesalers and contractors—and each individual business organization in each of the groups, will profit most through real cooperation.

While these principles have a national as well as a local application, the electrical industry is a great institution and as such naturally moves at a slow rate of speed. These remarks, therefore, are addressed to local groups because the creation of some new business and the planning for the certain future expansion is the immediate problem of the local group, and the local group is in a better position to take immediate action.

The first of these two principles will no doubt be accepted by everyone without question, but how about the second?

It seems unnecessary to take the space to discuss all that cooperation means, in the sense in which it is used here; it is safe to assume that everyone who reads this knows what it means. Acceptance of the second principle is fundamental. It must be accepted by each individual concerned, with full knowledge and realization of all that it includes, otherwise there is no basis for any effective plan.

It is confidently believed that in many hundreds of cities and towns the majority of the electrical group

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are not satisfied with existing conditions and have sufficient vision to comprehend the far greater profit that will surely accrue to each individual through united effort. In any such community, both of the two basic principles will find ready acceptance and the first step in organizing for better business should be to bring about an agreement to this effect between qualified representatives of all branches of the industry, including the inspectors.

Having decided to give a fair trial to the new idea of all working together for the common good, some sort of organization should be effected, if none exists already. This should be an all-industry association and whatever it may be called, it will to all intents and purposes be an electric league. The details of organization are relatively unimportant. The important matter is to get under way without delay.

House Wiring First

Without any question, the class of work that should receive first attention is house wiring. There are two reasons for this conclusion.

First, the utilities, manufacturers, wholesalers, appliance dealers, and many contractors agree that the home is the most fertile field for promotional efforts right at the present time.

Second, after a large amount of work extending over a considerable period of time, standards of adequacy for house wiring have been developed and have been officially approved by the entire electrical industry. These standards, together with a model form of specification for house wiring, are now ready to be put to immediate use by all local groups.

In order to make intelligent use of the House Wiring Standards they should first be studied and discussed until they are thoroughly understood. Particular attention should be given to the branch circuit rules, the list of fixed appliances for which provision should be made, and the method of computing the service capacity. In the light of our present knowledge, the standards are very nearly right in every particular and they may safely be accepted as representing the right way to wire houses.

Where local ordinance regulations that limit the number of outlets per circuit in dwellings unnecessarily increase wiring costs by requiring more circuits than are necessary, such rules should be removed from the ordinance as soon as possible. The standards are fully in accord with the National Electrical Code, in fact they require in many cases about twice as many circuits as are required by the present edition of the Code, and it is believed that they will be found to provide for a fully adequate circuit capacity in every case.

Large Budget Not Needed

It is assumed that in many localities it will be found difficult, or even impossible, at the start to raise any considerable sum of money for promotional work. Time and effort will be required, but these commodities are somewhat more plentiful than money at the present time and much can be accomplished with only a very small expenditure of money. A sizable appropriation for the work would, of course, enable the organization to carry on the work more rapidly and effectively, but this discussion is confined to work that can be carried on with a very limited budget.

A copy of the standards should be placed in the hands of every interested individual in any branch of the electrical business in the city. Copies should also be distributed to the architects if a national distribution to all architects has not already been effected. The standards can be obtained at a cost not exceeding 5 cents per copy and the cost of the specifications will probably be about the same.

Personal Contacts

Personal contact should be made with every architect, in the manner that seems likely to be the most effective in each individual case. If one or two representatives of the architects can be brought in as members of the promotional group or committee, so much the better.

Other points of contact with the general public will suggest themselves and advantage should be taken of every opportunity to explain that the entire electrical industry has officially adopted certain standards for house wiring, that these standards are based upon the actual needs and requirements of the household, and why the standards should be closely adhered to. In all sales efforts it should be borne in mind that the public is only very slightly, if at all, interested in the wiring itself. It is what the wiring will do and what it makes possible that is of real interest to the public. The public can be induced to become very much interested in electric cooking, electric refrigeration, electric water heating, complete electric kitchens and the multitudinous other comforts, conveniences and economies made possible by adequate wiring in the home.

The booklet containing the standards consists of a concise technical statement of the requirements for adequate wiring in the home. No effort has been made to give it sales appeal, as it was not intended for this purpose. Little would be gained by a general distribution of the booklet to the public. An exceedingly attractive and well-prepared booklet, designed to bring out the many advantages of a completely equipped electrical home, has just been issued by the Edison Institute, formerly N.E.L.A.

Commercial Buildings

It would be very short-sighted to limit any effort to promote adequate wiring to house wiring alone. Some work is being done in other classes of buildings. Much more will be done as general conditions begin to improve and there is no reason why this opportunity for additional business should be neglected. The electrical industry is failing to do its plain duty to the general public in every case where it does not at least explain to the owner, architect or builder the ultimate economy and better service to be obtained from an adequate wiring installation.

No progress can be made in the promotion of adequacy until suitable standards have been set up. Without standards, all talk about adequate wiring is vague and indefinite and can never lead to sales to the public in any worth-while volume. There are available at the present time the "Commercial Wiring Specifications" and the "Industrial Wiring Specifications," published by the N. E. L. A. These standards may be made use of by local organizations as the basis for the design of wiring systems for other than residential occupancies.

In the succeeding articles of this series it is proposed to discuss in some detail the matter of costs in house wiring installations made according to the standards, bringing out the percentage increase in cost over the ordinary job, the division of this increased cost between material and labor, and proper methods and data for estimating. Partial installations in new houses and additional work in already-wired houses will be given special attention.

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Construction details of first installation of

Aluminum Channel Risers

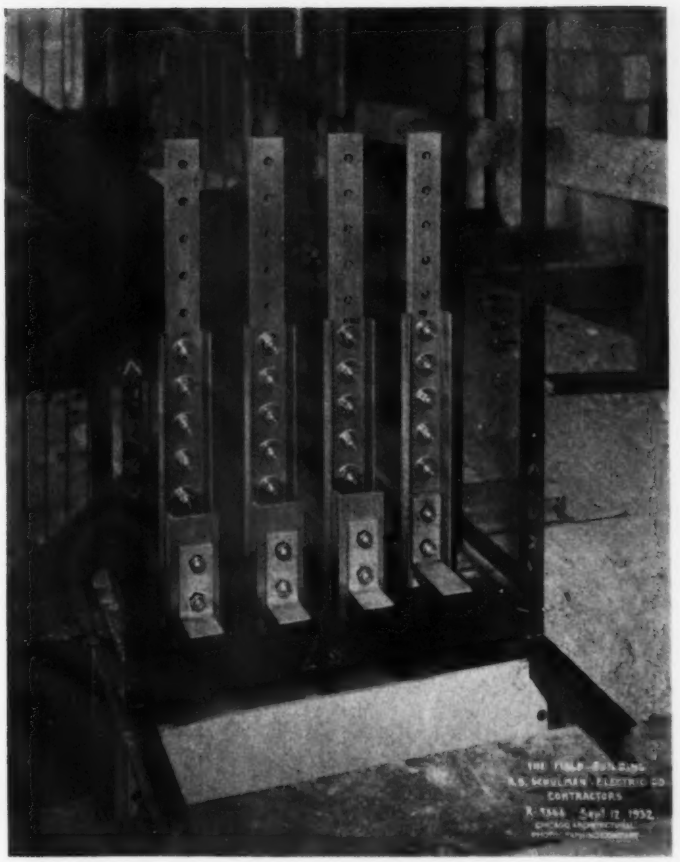

Fig. 4—Side view of two channel assembly showing splicer, bus supports, angle framework and portion of transite enclosure.

By
RALPH H. DECKER

A. S. Schulman Electric Co.
Chicago, Ill.

THE Field Building now being erected in the Loop District of Chicago not only embraces the city's first A.C. vertical network but the use of aluminum channel bus risers for secondary distribution.

This building occupies a ground area of 190 ft. by 323 ft. There are three basement levels below the first floor; the main portion extending to the twenty-fifth floor level, above which there is a 20-story tower. The rentable area approximates 1,000,000 sq. ft.

The connected power load exceeds 5,500 hp. and the connected lighting load is in excess of 4,500 k.v.a. figured on the basis of 3 watts per ft. for rentable area, and lower values for public and building service areas. The maximum demands for power and lighting have been computed at approximately 3,500 k.v.a., and 2,300 k.v.a. respectively.

The use of aluminum channels for the risers in the allotted restricted space, presented a multitude of new problems in design and installation by the electrical contractor, each of which will be described.

There are four aluminum channel bus risers in the 24-story main building, hereinafter referred to as the N.W., S.W., N.E. and S.E., risers, and two aluminum channel bus risers in the 20-story tower, designated as the West and East tower risers.

These risers are restricted to lighting service for the entire building. The N.W., S.W., N.E., and S.E. risers are each served by bus feeders from the basement, fourth and twenty-fourth floor switchboards. The lower end of the West and East risers in the tower are served respectively by bus tie feeders from the upper end of the S.W. and S.E. risers in the main building, the West and East risers further being served by bus feeders from the switchboard on the forty-fourth floor level.

Bus feeders and bus tie feeders are restricted to cable and conduit on account of limited furred ceiling space.

Power service throughout the building is provided from the power section of the four switchboards and this is not only desirable, but particularly feasible, inasmuch as the power centers are generally located on the same floor as the switchboards, and in some instances only one or

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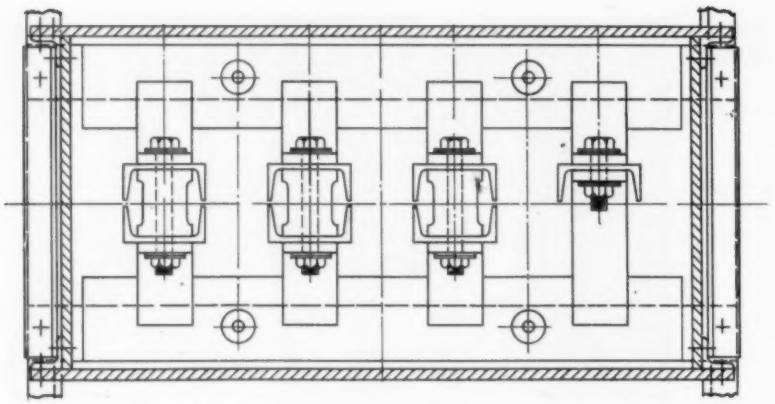

Fig. 1—Plan of two channel assembly, bus enclosure and bus support at fifteenth floor for S. W. riser.

two levels above or below the switchboard.

The risers comprise approximately 6,600 lineal ft. 4 in., No. 2.58 electrical conductor, 99.4 per cent pure aluminum channels within a rectangular transite enclosure assembled on a steel angle framework extending the full height of the respective risers. A straight rise of channels was maintained.

Each of the six risers consisted of a single channel for phases A, B and C, and the neutral, with the exception that the lower half of the S.W. riser between the third and fifteenth floors, comprised two channels for phases A, B and C and one for the neutral, the back channel of the two channel assembly for phases A, B and C continuing above the fifteenth floor as phase channels for the remainder of the rise. Figs. 1, 3, 4 and 5 show the two channel arrangement and Fig. 2, the single channel arrangement, respectively, below and above the fifteenth floor of the S.W. riser. The single channel assembly for all other risers is similar to that indicated by Fig. 2. Fig. 3 is a section of the S.W. riser, and its support at the fifteenth floor.

The phase and neutral channels are spaced on 7-in. centers with their webs in the same plane, thus being in the proper structural position to resist short circuit stresses.

The buses are supported at approximately their mid-point thereby eliminating expansion joints and intermediate supports, they therefore being free to expand toward their upper and lower ends.

Following the decision to provide one support for each riser, the question as to the length of channel sections completing a riser presented a troublesome but interesting aspect. A riser with no joints would be ideal, but the height of the riser eliminated this possibility. The lengths of individual sections of channel were finally determined by restrictions in shipping and handling.

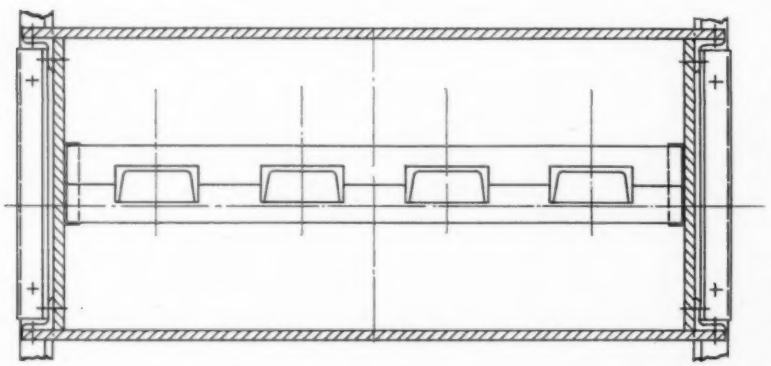

Fig. 2—Plan of single channel assembly, bus enclosure and spacing and aligning bars for S. W. riser above fifteenth floor.

The building is being erected in sections, the six risers being installed at different periods in the following order. The N.W. riser with the west section, the S.W. riser with the center section; the N.E. and S.E. risers with the east section, and the West and East tower risers with that portion of the building.

This program permitted the purchase of aluminum as needed, thereby eliminating excessive storage, and handling charges, and the comparatively light weight of this material, enabled the shipments to be made at L.C.L. freight rates.

It was found that 65-ft. gondolas used for shipping structural steel were available and this was a factor in determining the lengths of channel sections. With a maximum length of 248 ft., 9 in. for the highest risers, and a support at their mid-point (the fifteenth floor in the main building), channels varying from 61 ft., 7 in. to 63 ft., 2 in. in length were provided. Two lengths were used below the point of support and two above, thus requiring but three joints in a riser.

The channel buses and their enclosures are erected as the structural steel work progresses, and it was found advantageous to have the crates of channels set in a vertical position at their riser location at the time the structural steel reached the tenth floor, and the shipments from the mill were timed for delivery on the required dates. No delays were occasioned, and demurrage and storage charges were eliminated, as the crates were trucked from the car the day after arrival, and hoisted in position.

To facilitate installation, the eight sections of channel for that portion of the bus above the support were in one crate, and the sections for the bus below the support were in two separate crates of seven each. Each channel was individually wrapped in waterproof paper and nested back to back and flange to web, forming a box girder effect as shown in Fig. 8, thereby eliminating distortion or buckling in handling and hoisting.

Approximately 400 board feet of 1-in. box pine lumber weighing 746 lbs. was required for the average crate, the gross shipping weight being in excess of 2000 lbs.

Each nest of channels was securely crated with this lumber which in turn was nailed and secured with steel

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banding, and each side of each crate bore its stenciled number, and an itemization of the contents, as well as having "TOP" and "BOTTOM" marked on all four sides at the top and bottom ends. It was imperative that these markings conform with the ends of the channels as crated. A channel could not be used in a reversed position as its drilling and grinding was detailed to conform to a variation of story heights and bus and feeder taps at irregular intervals. Additional charges were made at the mill for inspection, guaranteeing, correct marking, drilling and grinding.

The crates were hoisted separately from the truck by the steel erection contractor, using a "three-point hitch" in the lift to the 10th floor beams, and a "two-point sliding hitch" from this location to a vertical position between the beams and girders bordering the riser shaft.

The many unusual and unique features in the installation of the buses, and the simplicity of design of the various parts, and their importance and interest merit the following detailed description.

Bus Supports

The bus supports previously mentioned are shown in detail in Figs. 1, 3, 4 and 5.

Steel angles bolted through the backs of the channels rest free in 3-in. by 3½-in. ebony asbestos insulating blocks, which in turn are bolted to 3½-in. by 3½-in. by ⅜-in. steel angles secured to 3-in. No. 6 channels spanning floor beams adjacent to the bus enclosure. The steel angles are of ½-in. stock and heavily zinc coated, aluminum being electropositive to zinc and zinc electropositive to steel.

Joints and Connections

The design and preparation of joints and connections in an aluminum member requires a different practice from that long in vogue for copper conductors and the need for securing efficient and permanent contacts is of paramount importance.

When exposed to ordinary atmosphere, aluminum becomes coated with a thin, firmly adherent layer of oxide which prevents an electrical contact with the underlying metal. If this oxide film is removed by scraping or scouring the surface, an oxide film is again formed about as fast as it is removed, and the thickness of this film may increase with prolonged exposure to moist air. Care, therefore must be taken in the preparation of contact surfaces.

A bare copper to aluminum contact cannot be maintained because of the destructive electrolytic action developed by the presence of moisture, and the oxide film which forms very rapidly, precludes the possibility of obtaining suitable electrical contact.

It is therefore a prime requisite that the above hazards be eliminated and that contact surfaces be flat and free from metal salts and dirt in order to obtain a joint sensitive to the bolt pressure applied.

All contact areas on aluminum channels and splicing bars, blocks and plates, were scratch-brushed at the mill with applications of "No-Ox-Id" grade "A" compound, tenacious in character and durable under adverse conditions of weathering and high temperature. The contact surface of copper connection angles for feeder lug connections were likewise scratch-brushed to a true surface in the shop.

At the time of the assembly of aluminum channels, splicing bars, blocks, plates, and the copper connection angles, the contact surfaces of all these parts were given an application of "No-Ox-Id" compound thoroughly rubbed in with fine emery cloth, and the assembly and bolting was completed without removing any of this film. This treatment reduced the initial resistance of the joints and preserved their efficiency by effectively sealing them against moisture.

This method provided a nearly perfect joint, and it is believed, a better joint than can ordinarily be secured between bolted copper parts. As compared with copper, aluminum is spongy in character and tends to freeze into the interstices of the copper angle surfaces. The compound used permanently adheres to the ground surfaces, remains in its natural state and is practically non-insulative.

A test showed that the joint resistance was less than that of a given section of the aluminum channels, which is accounted for by the method of preparing these contact surfaces, the design of splicing members and the liberal use of large bolts and washers.

Figs. 4 and 5 are photographs of joints occurring above the bus support in the S.W. riser. Fig. 6 shows a detail of the splicing plates for a single channel assembly. The method of making feeder taps to the channels is indicated in Fig. 7, a short aluminum splicing block being used for a two channel assembly.

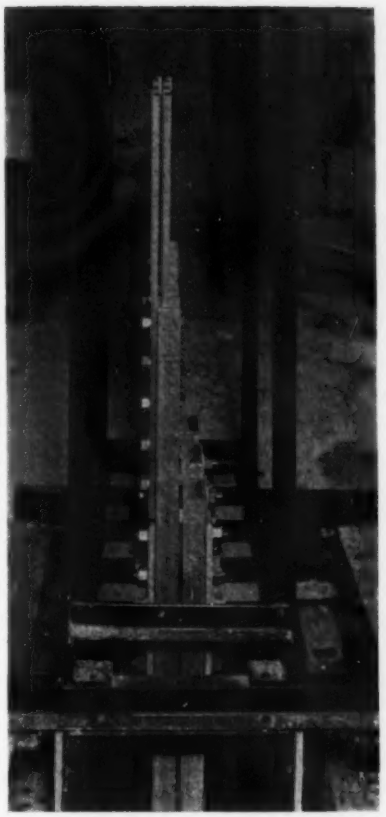

Fig. 5—End view of two channel assembly showing splicer, bus supports, angle frame-work and portion of transite enclosure.

Bolting

Research has shown that the efficiency of a joint depends upon the pressure exerted upon the joint, the resistance decreasing with an increase of pressure. A moisture proof joint will suffer no increase in resistance providing a reasonably constant high pressure is maintained.

On account of the high co-efficient of expansion of aluminum parts compared with steel bolts, ¾ in. standard hexagon head bolts and nuts of 17ST ALCOA aluminum alloy (possessing the same tensile strength as equal size steel bolts) were used with ⅛ in. thick aluminum washers under the head and nut, and a "shakeproof" lock washer under the nut. Bolts were drawn-up tight with-

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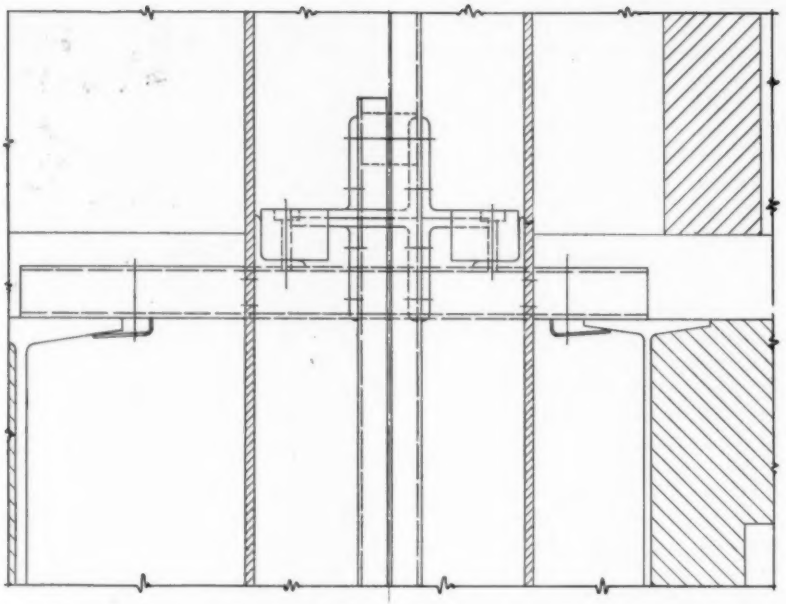

Fig. 3—Section through S. W. riser at fifteenth floor showing details of bus support, enclosure and method used to support the enclosure which is typical for all floors.

out shearing and the size of bolts and washers selected provided a high unit pressure. The results of the test of the joints clearly indicated the wisdom in providing the size and number of bolts used.

Staggered bolt spacing was eliminated, all holes being drilled on the center line of channels, splicing members and spacing blocks, thereby simplifying fabrication and permitting easy and rapid assembly, inasmuch as all parts were reversible. The use of one size bolt facilitated the work.

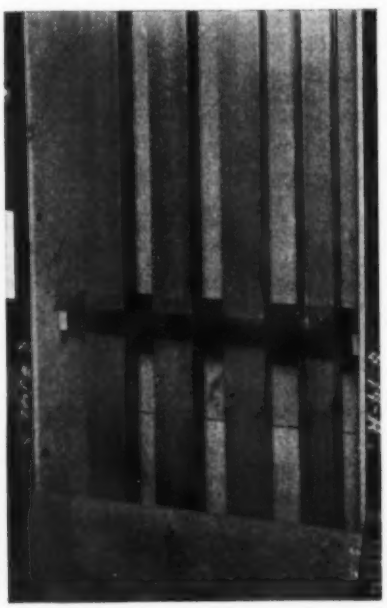

Fig. 9—Front view of two channel assembly showing ebony asbestos spacing and aligning bar and saddle supports at side of transite enclosure.

Splicing Members

The use of sleeves or spacers with bolts is ordinarily associated with a two-member bus assembly. The reader's attention is directed to the splicing member, Fig. 9, designed for this installation. These were of aluminum, rolled, machined, drilled and tapped as detailed. By the medium of ⅜ in. F.H. aluminum screws inserted in countersunk holes in the back channel of the two channel assembly, the splicing member was temporarily secured to the inside face of the web, the front channel then being placed in position against the splicing member and bolted in place.

Bus taps for lighting panels at each floor and bus feeder connections were similarly made by using an aluminum spacing block at each of these points as detailed in Fig. 7.

This type of splicing member and spacing block was economical from the standpoint of manufacture and assembly, and permitted the use of uniform copper connection angles bolted to the faces of the channels. A further important factor in their use was the equalization of the load between the two channels forming an assembly. The tapping of buses at alternate floors with any other form of splice would have resulted in an unequal loading of two channels.

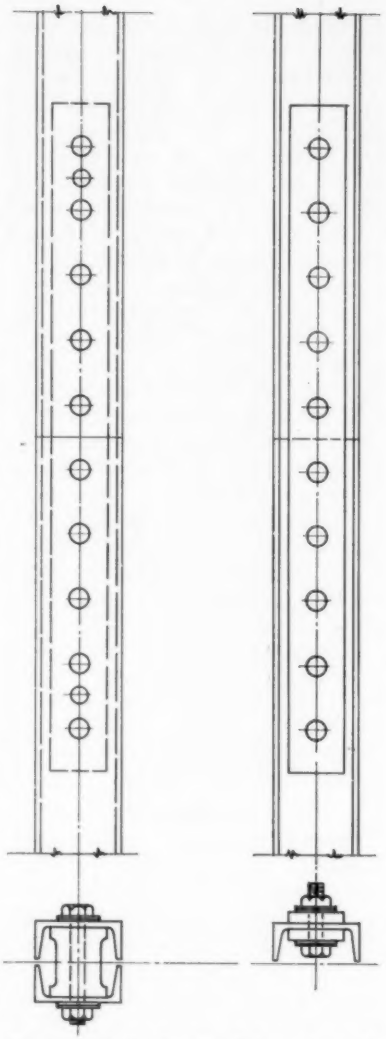

Fig. 6—Method of splicing channels.

The flat aluminum splicing plates used for a joint in the single channel assembly were designed to provide an overlap and thickness adequate for current carrying capacity and the best efficiency so far as "stream line effect" of the current was concerned.

The rate of heat dissipation at a joint depends on the amount of overlap and in this computation allowance was made for lost area due to bolt holes. The consideration of mechanical features such as variation in pressure due to the expansion of the parts comprising the joint is negligible inasmuch as aluminum bolts and parts were used.

End contact between channels was not desired and an increase of 1/16 in. in the spacing of the two middle

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Fig. 10—Front view of two channel assembly showing method of making cable taps to the buses with solderless connectors.

holes in splicing members permitted sufficient clearance between channel ends to compensate for irregular sawing of the ends or burrs.

Assembly of Risers

As a preface to this subject the reader should be informed that the channels were fabricated from detail drawings prepared by the electrical contractor, the drawings indicating all drilling, countersinking, grinding, etc. The drawings further directed the stenciling of the item number at each end of a channel, the floor numbers in their respective positions, and item number of a splice, the item number of the spacing blocks and the item number of the various copper connection angles at designated locations of holes and ground surfaces. This permitted the correct assembly of the buses with no time lost by study and reference to drawings.

In a description of the assembly of the bus risers, the S.W. riser will be taken, it being fairly typical of the procedure used in completing the others.

The ebony asbestos insulating blocks and their steel angle supports were bolted in place, and the lumber on crate No. 1 containing the seven channels to be suspended from the support, and the lumber on crate No. 2 containing the seven channels for the lower end of the riser were removed.

The back channels from crate No. 1 for phases A, B and C and the one neutral channel were hoisted to the fifteenth floor level; the steel supporting angles bolted on and set in the ebony asbestos block. The front channels for phases A, B and C were similarly secured in position and bolted to the back ones with the spacing blocks previously described.

This same procedure was followed in assembling the channels completing the lower end of the riser. The eight channels completing the riser above the fifteenth floor were handled in a similar manner, the lengths forming the section above the fifteenth floor being next installed, with the top section following. The average weight of the individual channels is 165 lbs.

Spacing and Aligning Bars

The 7 in. spacing and alignment of the channels above and below the support at the fifteenth floor was maintained by the use of a pair of notched ebony asbestos bars located 2 ft. above the respective floor levels, two pair of blocks being used in story heights exceeding 13 ft. The use of a pair of these bars with a two-channel assembly is shown in Fig. 9, bars for a one-channel assembly being identical except for the depth of notches.

In consideration of expansion, the notches were made with 1/32 in. clearance thus permitting the channels to slide vertically, the length of the bars being such as to permit them being dropped snugly into No. 10 gauge steel saddles bolted to the sides

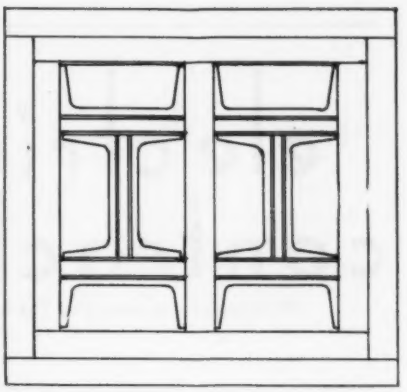

Fig. 8—Method of nesting and crating channels for shipment.

of the transite enclosures. The bars are not otherwise held in place except that 3/8 in. bolts of a non-magnetic material are bolted through the two parts forming a pair.

Bus Taps

Fig. 10 shows the method of making bus feeder and panel taps to the channels, certain details of which have been previously described in this article. Clamp type solderless lugs are used throughout and secured to the copper connection angles with "Parkerized" hexagon bolts and nuts and "shakeproof" lock washers, with one bolt through the shank for cables up to No. 4/0 and two bolts for larger size cables.

The design and installation of the bus riser system represented considerable pioneering and it has been the intent to convey to the reader only the important factors involved.

The problem of bus enclosure will be treated in a separate article to follow.

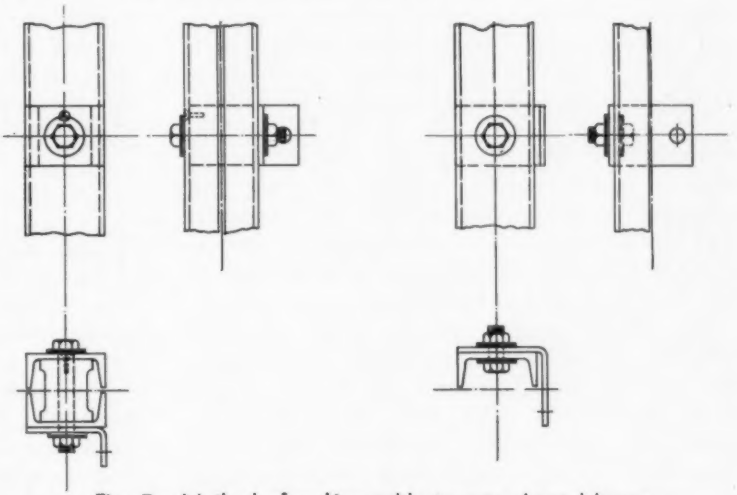

Fig. 7.—Method of making cable taps to channel buses.

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electrical contracting

With which is incorporated The Electragist

S. B. WILLIAMS, Editor

ORGANIZED EMPLOYERS

THE evolution of the organized method of handling labor matters between the electrical contractors and the I.B.E.W. has been most interesting. Many plans have been made and while none of them have been successful, they have all disclosed a certain portion of the road to success.

The fortunes of the labor section of the contractors' national association rose and fell periodically. After this came the Electrical Guild of North America, large in promise, having what the labor section had always lacked, viz., money and management. It, too, failed.

We are now back to the point where there is no organized body set up to negotiate with the I.B.E.W. on national matters. Some organization is necessary and since an independent body such as the Guild cannot succeed, it becomes obvious that a labor section of the N.E.C.A. must be set up.

The I.B.E.W. if anything, is more anxious than the contractors to have a strong and representative organization with which to deal. There is no stability without a strong organization and the I.B.E.W. knows it. For that reason, the I.B.E.W., while undoubtedly welcoming the formation of such a labor section, would naturally be cautious in negotiating with it until assured that the section has a representative membership and the support and confidence of the closed shop contractors.

The labor section, in the past, has not had this confidence, nor did the Guild have the confidence of the rank and file of closed shop operators. The lack of confidence came from the lurking suspicion that these organizations of closed shop employers, in the past, have had more consideration for the big contractors and interstate operators.

If such a section of N.E.C.A. be formed these suspicions must be allayed, and for that reason no section should be set up until there is an assurance of a wide-spread membership, geographically, and a fairly representative membership.

CONCENTRIC WIRING

AT the March meeting of the Electrical Committee, N.F.P.A., bare neutral, the forerunner of concentric wiring, will receive attention. While it is being promoted as a less expensive method of lower wiring, the committee will have only its safety factor to judge.

Elsewhere in this issue there will be found some photographs of concentric wiring being installed in Detroit under the auspices of the Detroit Edison Company. While this company, which has a fine reputation for its own plant construction, would undoubtedly make every effort to have these test installations, which it is sponsoring, carefully done, there has been the desire to show that concentric wiring was considerably less expensive to install. Our only conclusion, therefore, is that these tests reveal the best type of an installation that can be expected with this material and still keep down costs.

Would this type of work be permitted with any system now recognized in the Code?

In the matter of costs, it is true that the contractor who is installing this work makes estimates that are far below what the wiring would cost with a recognized system. Those, however, who know construction costs are not inclined to believe that the actual cost to install, in spite of the reported contract prices, are any lower than for the standard house wiring systems other than conduit.

N.E.L.A.'s SUCCESSOR

THE National Electric Light Association has been dissolved and in its place there has arisen the Edison Electric Institute—same officers, same staff, same headquarters, but a different policy.

The new body will be a trade association, confining its membership to light and power companies and their employees, and binding its membership to a code of ethics, the principal element of which is fair and open

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dealings with the public and investors. It is the intention of the new body to audit the financial statements of member companies in order that the public and investors may not only have figures that will be accurate and mean what they say or imply, but that confidence in the industry might be restored.

By divesting itself of all propaganda activities the new body will have more time to devote to the promotion of the use of electric energy. This in itself will undoubtedly bring a different viewpoint to bear on the commercial problem which unfortunately, in the past, has been left pretty largely to employees without voice in the high councils.

It is our opinion that when the executives of the power industry can be persuaded to give to the commercial problem the same time and thought and money that they have given to boomerang propaganda, we will have a united industry going forward in the same direction selling electric service.

NECA—NEWA CONFERENCE

THE meeting of the joint committee of the National Electrical Wholesalers Association and the National Electrical Contractors Association, which was held last month in New York, while it accomplished little more than getting certain problems out in the open, was most encouraging in that it revealed a very keen desire on the part of the top executives to find a way whereby wholesalers could work more constructively with contractors.

With the wholesaling industry divided as it is into two different economic groups, the national houses and the independent houses, it is probably always going to be difficult for any hard and fast operating policies to be agreed on by the two associations. That does not mean, however, that these two bodies cannot thoroughly discuss such principles as credit control, classification of industrial accounts, and competition with customers in such a way that local groups can find guidance for setting up their own mutual programs.

The wholesaling business and the contracting business are both very largely local and, for that reason, any workable plan must be initiated and adopted locally. It is advisable, however, always to know that such plans are in accordance with nationally accepted principles. National acceptance between the two associations will give the local groups the necessary encouragement to work out mutually desired plans.

For instance, in a national meeting the most that can be expected on the subject of classification of accounts is the setting up of a very broad and general statement of the type of accounts that are entitled to wholesale discounts. This very general classification, however, can be worked out in detail in every locality once the principle of the necessity for account classification has been accepted by the two national groups.

Inasmuch as these national principles must be locally interpreted, might it not be advisable in the future, in these joint meetings, to have a larger representation from independent houses? Because they represent so definitely the local point of view, because they are so much closer to the contractors than the executives of large national corporations could be, and because their customers probably include a much wider range of contractors viewed financially, they should be able to give to the joint committee a more personalized and, therefore, perhaps a more practical viewpoint.

Because national houses are involved the deliberations of this joint committee will, of course, always be subjected to the closest scrutiny by counsel. This is desirable because neither group has any desire to try to work out these mutual problems in any but a perfectly legal and fair way. On the other hand, counsel sometimes feels that its job is solely one of preventing mistakes. To do so counsel frequently emulates the sailor who would never row a boat except in the channel dug for the ocean liner. Perhaps counsel might be encouraged to take the viewpoint that these negotiations are for the purpose of improving the economic status of two great branches of the electrical industry without working any hardship upon the customer. Whatever economic improvements shall come shall come byway of the elimination of wasteful selling methods. If counsel could be persuaded to see the problem in this light perhaps counsel could be constructive and offer suggestions whereby the desired ends could be accomplished simply and legally.

Although little was accomplished at this first joint meeting between the two national associations, the confrerees should not be discouraged. The spirit is willing and the way will be found.

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\\\ code chats ///

A MONTHLY DISCUSSION OF WIRING PRACTICE AND QUESTIONS OF INTERPRETATION, PRESENTED WITH A VIEW TOWARD ENCOURAGING A BETTER UNDERSTANDING OF THE NATIONAL ELECTRICAL CODE

CONDUCTED BY F. N. M. SQUIRES
ASSISTANT CHIEF INSPECTOR, N. Y. BOARD OF FIRE UNDERWRITERS

DOUBLE THROW SWITCH ON MOTOR LOAD

I have a contract which specifies the installation of 2-5 H.P. motors. These motors are to be operated by a double throw switch whereby only one of the two motors can be operated at one time. Would you require the wiring for 10 H.P. and consider it a 10 H.P. load?

Inasmuch as, by the use of the double throw switch, but one motor can be used at one time the load at any time will be but 5 H.P. Therefore the feed to the double throw switch would be figured on the basis of 5 H.P.

If, however, the contract specifies that the feed is to be sufficient for 10 H.P. then wires for that capacity should be furnished. If the customer wants 10 H.P. capacity and specifies it in his contract he is entitled to it and should get it and also should pay for it although it would not be required under the rules.

WHITE WIRES FOR POWER CIRCUITS

Is it permissible to tap a 220 volt A.C. single phase power circuit from an existing single phase 110-220 volt 3-wire lighting main with two white wires?

The 3-wire mains are black from which I wish to tap two white wires therefrom to a 2-pole main line fuse block, then continue the main to a distribution block for two ½ H.P. S. PH. 220 volt motors. I also wish to use white wires for the two individual motor circuits. The entire installation is to be installed in conduit.

In case this installation would not be satisfactory, due to the use of white wires, could I overcome the situation by painting the conductors black at all junctions, switch cabinets, etc., so that these conductors can be identified as 200 volt circuits?

This question is very definitely and clearly answered in rule 500-f which states that, "Wires having white or natural grey covering shall not be used in identified systems or circuits other than as conductors for which identification is required by this section unless the identified wire is rendered permanently unidentified by painting or other means at every outlet."

BONDING AROUND OUTDOOR WATER METER

Is it necessary to bond a water meter if it is located outside? It is located underground 80 ft. from where the installation is made in the dwelling. If it is necessary would you call this jumper subject to mechanical injury if it is put around the meter, which is located in a box underground. Would I have to use No. 4?

This is a matter which should be decided by the local inspection authority. If the soil condition surrounding the 80 ft. run of water pipe out to the water meter is favorable to effective grounding the use of a bonding jumper around the water meter might be eliminated, but if soil conditions are not favorable or even doubtful the jumper should be used. As the cost of a jumper is so small there seems to be but little excuse for not using one.

If the water meter is located in a box this would seem to provide suitable protection to the bonding jumper against mechanical injury.

The size of the jumper should be determined by rules 907-b or c, or 907-n or o depending on conditions and what is to be grounded.

For instance on an a.c. system a No. 8 ground wire will take care of grounding service conduit up to 1 in. which could contain 4 No. 8 wires.

GROUNDING

a. Is an 80 ft. water pipe running underground under 4 or 5 ft. of soil from rear of building, where water main enters, a sufficient ground, if it is bonded across the water meter with a No. 8 is it according to the Code?

b. If bond is left off will same be a sufficient ground?

c. If water main was disconnected in rear building would 80 ft. of ¾ in. water pipe running 4 or 5 ft. underground be sufficient for ground in front of building? Also state section and article of the Code pertaining to the above condition.

a. Rule 908-d requires that for grounding connections, "The point of connection to the water piping system shall be located on the street side of the water meter or at a cold water pipe near the equipment to be grounded in which case the connection with the piping system shall be made continuous and permanent by bonding all parts of the piping system within the building which are liable to become physically disconnected, such as at meters and service unions by means of a suitable shunt whose joints, current carrying capacity, and mechanical protection shall be not less than that required for a grounding conductor."

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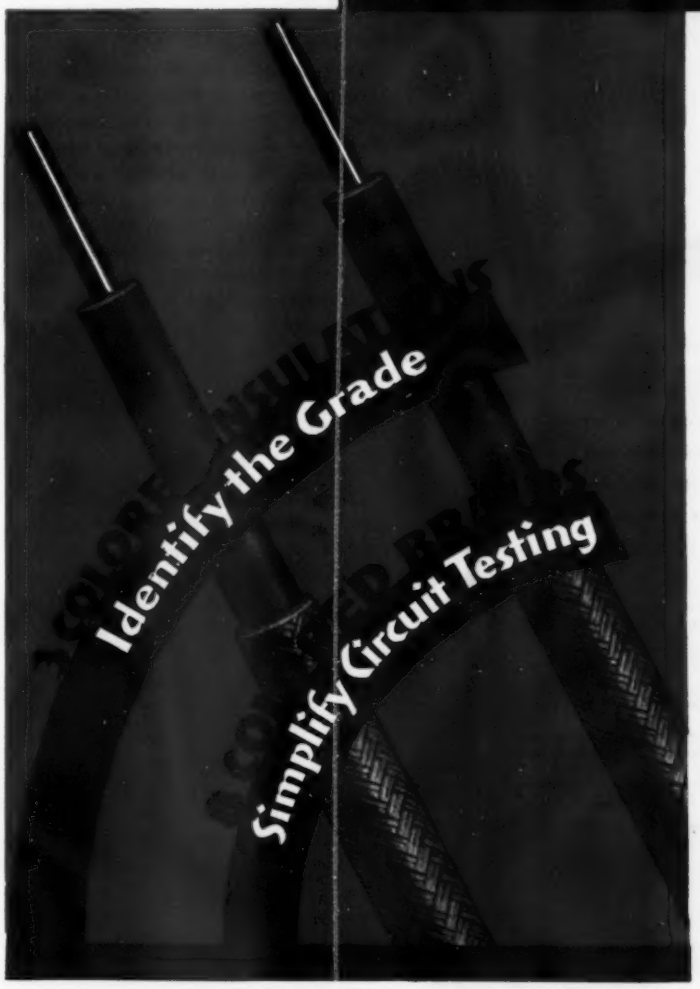
DOUBLE VALUE

AT NO EXTRA COST

SAFE Electrical Cords
UNDERWRITERS LABORATORIES INSP. CORD



The self-identifying features of G-E Code Wires provide ease, safety, and economy in installation at no extra cost. Three colored rubber insulations (Black-Red-Green) furnish immediate identification for Code, Intermediate and 30% grades. Eight different colors of braids facilitate circuit testing, save time on extensions and alteration work.

Each grade of wire is manufactured with the same uniform centering of wire in its rubber jacket — the same tough braid — the same hard, smooth, clean, and moisture-proof finish to insure easy pulling. Overall diameters are the minimum allowed by the code. Every coil is tested, and every foot exceeds code requirements.

Speed up wiring jobs by using G-E Code Wires. They cost no more and assure "trouble-free" installations. For further information see your nearest G-E Distributor or write direct to Section W-202, Merchandise Department, General Electric Company, Bridgeport, Conn.

GENERAL ELECTRIC

CODE WIRES

MERCHANDISE DEPARTMENT, GENERAL ELECTRIC COMPANY, BRIDGEPORT, CONNECTICUT

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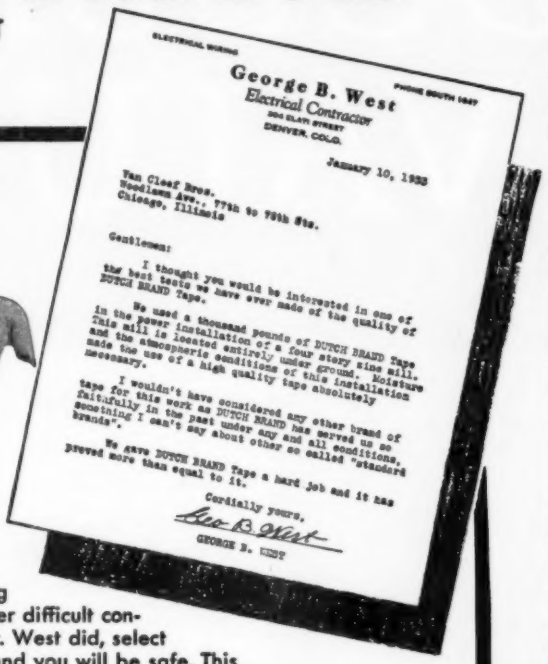
"We Gave DUTCH BRAND Tape a Hard Job"

Says GEORGE B. WEST
Electrical Contractor
Denver, Colorado



George B. West
Electrical Contractor
DENVER, COLO.

January 10, 1935

Van Cleef Bros.
Woodlawn Ave., 77th to 79th Sts.
Chicago, Illinois

Gentlemen:

I thought you would be interested in one of the best tests we have ever made of the quality of DUTCH BRAND Tape.

We used a thousand pounds of DUTCH BRAND Tape in the power installation of a four story nine mill. This mill is located entirely under ground. Moisture and the atmospheric conditions of this installation made the use of a high quality tape absolutely necessary.

I wouldn't have considered any other brand of tape for this work as DUTCH BRAND has served us so faithfully in the past under any and all conditions. Something I can't say about other so called "standard brands".

We gave DUTCH BRAND Tape a hard job and it has proved more than equal to it.

Cordially yours,
Geo B. West
GEORGE B. WEST

SAFETY first is a good slogan for anybody. When it comes to selecting tape for use under difficult conditions, do as Mr. West did, select DUTCH BRAND and you will be safe. This "Extra Service" product stands up! Here's why:

1. Manufactured by our own 4 ply saturation process. Not 2 coats or 3 coats of compound, but 4 plies of rubber uniformly applied that give it excellent adhesiveness and long life in any climate.
2. The 4 ply process eliminates pin holes and insures extra insulating safety. One thickness of this tape resists 2200 volts.
3. The edges do not fray. Every inch is clean cut and usable right down to the core, no waste.
4. It is made on a base of tough, close-woven sheeting that brute strength can't easily break.
5. Its great adhesiveness is always fresh. It lasts and is not of the gooey or messy type. It won't dirty the hands.
6. It is neatly packaged in small sizes for the consumer and shop sizes for the contractor.

You don't have to believe what we say or even what Mr. West says about DUTCH BRAND. Make a test yourself. You don't have to buy a roll of tape to do it. Just clip the coupon below for a full size free test roll.

DUTCH BRAND Friction Tape, Rubber Tape and Soldering Paste are sold by electrical jobbers everywhere

VAN CLEEF BROS. *Established 1910*

Manufacturers DUTCH BRAND Friction and Rubber Tape and Soldering Paste.
Woodlawn Ave., 77th to 78th Sts.
Chicago, U. S. A.

DUTCH BRAND Soldering Paste. A scientific mixture. Cleans as it works. Holds solder fast. Less paste required per job.

DUTCH BRAND Rubber Insulating Tape
Fuses instantly without heat. Molds into one solid piece. It s-t-r-e-t-c-h-e-s without breaking because it contains 20% more live, new rubber.

2-33
Van Cleef Bros.
Woodlawn Ave., 77th to 78th Sts., Chicago, Illinois
Gentlemen: We would like to test the "Extra Service" qualities of the following DUTCH BRAND products:
☐ Friction Tape ☐ Rubber Tape ☐ Soldering Paste

Name.....
Kind of Business.....
Street Address.....
City..... State.....
Jobber's Name.....

DUTCH BRAND FRICTION TAPE

b. The bond around the meter should not be left off except by permission of the inspection department. If it is omitted we assume that at sometime the water meter might be disconnected and we would then be confronted with the same condition as in c.

c. This question is one for the local inspection authority to decide. The determining factors are so variable at different locations that it would be difficult to determine the exact conditions without being on the particular job itself.

In an average location with moist soil the 80 ft. of water pipe would afford sufficient grounding but a nearby location with dry soil condition might not.

As to what condition would be satfactory, we must refer to rule 901-e where we learn that "The combined resistance of the grounding conductor and its connection with the ground shall not exceed 3 ohms for water pipe connections or 25 ohms for buried or driven electrodes."

Effective grounding has become so all important in our present day electrical systems that no effort should be spared to secure the best possible.

OPEN WIRES FOR SERVICE ENTRANCE

Does the Code require a rigid iron conduit service (from entrance at outer edge of building to meter loop), or is an open wire service, properly installed in accordance with the Code rules for open wiring, permissible.? If all metal service be mandatory, please cite me particular section of Code requiring same.

Rule 404-g states that "Overhead (service entrance) wires shall enter buildings only in rigid conduit, or as separate individual wires or through multiple conductors cable (service entrance cable) approved for the purpose." Again the sentence following the one quoted above shows that open wires may be employed on service entrance wires for it says "Where open wires are used, drip loops shall be formed on the individual wires" which shall then slant up toward the inside in order that drops of rain will not follow the wires to the inside. Again, the fine print note which follows 404-g is only a recommendation and not a requirement that rigid conduit be used.

You'll find "Central" in service in many of the nation's most prominent buildings

It is significant that leading architects and electrical contractors consistently specify and use "Central" Rigid Steel Conduit to protect the vital electrical network of many of their important construction projects.

"Central" offers a complete choice of rigid steel conduit to meet every building requirement and every condition of service.

CENTRAL TUBE CO.
PITTSBURGH, PA.

CENTRAL RIGID STEEL CONDUIT

Insure

Future Profits With GREENLEE TOOLS

YOU must be able to compete on an even basis with other contractors, if business is to be had at a profit. And there is no better way to do this than by having proper equipment. Many have learned that proper equipment includes the Greenlee Tools mentioned below. You will agree with them, too, if you will but investigate.

Hydraulic Conduit Benders

Greenlee Hydraulic Conduit Benders insure profits because they bend conduit quicker and easier than by other methods. In addition, they make smooth, even bends, eliminating many fittings and making it easy to pull in wire. They are easy to take to the job, too, because they are portable.

Knockout Tools

Greenlee Knockout Punches and Cutters make it easy to enlarge holes in switch boxes, cabinets, etc. They form clean-cut holes quickly and accurately, without any reaming or filing.

Other Tools

Hydraulic Pipe Pushers
Joist Borers — Bit Extensions
Electrician Bits

Let Us Send Complete Information

GREENLEE TOOL CO.
ROCKFORD ILLINOIS

GREENLEE TOOL CO.
ROCKFORD, ILLINOIS

Please send complete information on the following:
☐ Conduit Benders
☐ Knockout Tools

Name .....
Street .....
City .....
State .....
My jobber is .....

2-33

N.E.C.A.
NEWS AND SERVICE INFORMATION

MATERIAL FOR THIS DEPARTMENT IS SUPPLIED BY THE HEADQUARTERS STAFF OF THE NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION
420 LEXINGTON AVENUE, NEW YORK, N. Y.

President, L. E. Mayer
14 North Franklin Street, Chicago, Illinois

Vice President, Earl N. Peak
1603 West Main Street, Marshalltown, Iowa

DIVISIONAL EXECUTIVE COMMITEEMEN

Eastern
Louis Kalischer
288 Livingston St.
Brooklyn, N. Y.

Southern
D. B. Clayton
844 Martin Bldg.
Birmingham, Ala.

Southeastern
W. W. Ingalls
315 S. W. 10th Ave.
Miami, Florida

Great Lakes
R. J. Nickles
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420 Lexington Ave.
New York City

Contractors Organized for Industry Welfare

JOINT CONFERENCE WITH WHOLESALERS

A Joint Conference of committees appointed by the National Electrical Wholesalers Association and the National Electrical Contractors Association was held in New York City on January 18, the entire day being devoted to discussion of mutual problems and plans for business development.

In attendance for the wholesalers were G. E. Cullinan, vice president, Graybar Electric Company, who acted as chairman of the conference; Robert Beller, president, Beller Electric Supply Company, Newark, N. J.; B. W. Clark, general manager, Westinghouse Electric Supply Company, and H. B. Tompkins, manager supply sales, General Electric Supply Co.

The contractors were represented by L. E. Mayer, Chicago, Ill., president of NECA; A. C. Brueckmann, Baltimore, Md.; H. B. Frazer, Philadelphia, Pa.; and Louis Kalischer, Brooklyn, N. Y., all members of the Executive Committee of the NECA.

There were also present W. J. Drury, chairman of the executive committee, NEWA, and Messrs. Davis and Tolles, managing directors of the two national associations.

The fundamental economy in the parts played by both electrical wholesalers and electrical contractors and dealers in the distribution of electrical commodities was mutually recognized, and the importance of each group in its relation to the other was clearly indicated.

From the views expressed it appears that the wholesalers believe they economically serve in the distribution of electrical commodities to municipal, state and federal departments, steam railroads and steamship companies, telephone, telegraph and electric power and light companies, industrials having their own electrical maintenance departments, and to electrical contractors, contractor-dealers and appliance merchandisers.

The question of credit conditions within the industry which, in the present general business situation are admittedly difficult, was given long discussion and earnest consideration. The wholesalers emphasized their realization of the inherent dangers that have existed and pointed out that they have taken precautions to pro-

H & H ILLUMINATED House Number Unit

for Houses Apartments Hotel Rooms

No. 7902

Two-gang unit **for 3 or 4 numbers: Nos. 100 to 9999 inclusive**

Single-gang unit **(7901) for one or two numbers: No. 1 to 99 inclusive**

Metal Display Stand

SELLS NOW—without waiting for general wiring jobs or new building. *CREATES* a profitable wiring job. Requires use of an inside switch control—an additional sale for you. Clear, white numerals, *illuminated at night*, can be read 75 feet away. *Sure to be seen* over front entrances of houses and apartments and for room numbers in hotels or office buildings. . . Cadmium-finish plate and rubber mat make a weatherproof job. Installed in standard one or two-gang wall boxes; takes 110-VOLT SERVICE. Standard 3-Watt candelabra-base lamp is supplied with each unit.

Illustration at left shows metal Display Stand—equipped with switch, warning light, cord and plug ready-wired for demonstration purposes in your store and in customers' homes.

HART & HEGEMAN DIVISION

THE ARROW-HART & HEGEMAN ELECTRIC CO. HARTFORD, CONN.

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ASK YOUR JOBBER SALESMAN

How to Get More Jobs With the Benjamin Line Now

THREE PROFITABLE ITEMS

The Duo-Service Floodlight

Specially Designed to Light Gasoline Service Stations

. . . proved to be the most effective method of lighting a service station. Weatherproof, rugged and durable; never needs repainting as it is finished in porcelain enamel.

The No. 5570 Sign Reflector

For Lighting Transom, Wall and Bulletin Signs

The Benjamin No. 5570 Sign Lighting reflector is easy to install, looks neat and inconspicuous and gives uniform lighting over the entire board with no scallops or shadows or light spillage. No need to bend conduit; pipe can be led straight into reflector neck.

The Junior and Utility Floodlights

Low-Priced Portable Units for Yard and Other Floodlighting

Handy, portable, weatherproof and efficient these low-cost floodlights provide many of the most important features of costlier floodlighting projectors. Can be attached anywhere and are provided with spike for sticking in turf.

The salesmen of Benjamin distributors are willing and eager to cooperate with you and show you how to get more jobs . . . right now . . . with the Benjamin line. Even in these times there are lighting jobs to be had. And constructive selling effort *plus* Benjamin equipment can get them for you. Here are two fields, of the ten offering the best opportunities for 1933:

Gasoline Service Stations Are Good Prospects . . .

Recent tests made by a large oil marketing company covering their entire chain of stations proved conclusively that adequate lighting not only increased trade after dark but actually increased the daytime trade of their stations by 25 per cent. Here are lighting jobs that you can get. Every service station in your territory is a prospect. Contact the oil jobbers and bulk station operators in your territory.

Yard Lighting . . . a New and Profitable Source of Jobs

People everywhere are realizing the need for a light in the back yard. Lighting the yard in the rear of the house not only keeps prowlers away but gives more time for play in the yard or work in the garden after dark. Police authorities too are urging business houses to light the rear entrances of their establishments for protection.

Write For These FREE Sales Helps

We have prepared a brief outline of the ten fields offering you the best opportunities for securing more jobs at this time with Benjamin equipment. It gives a complete list of various sales helps available to you in each field. Write for your copy now.

Let's Pull Together for Victory in 1933

BENJAMIN

Benjamin Electric Mfg. Company

New York Des Plaines, Illinois San Francisco

tect themselves, so far as possible, against unreasonable losses from this source. It was brought out that with the widespread bank failures and the effects of lack of business on even the most conservative of their customers, some of whom, even though they had discounted their bills for many years and apparently had been risks of the highest type, have been forced into bankruptcy, it has been inevitable that unfortunate losses should occur and that even more watchfulness is needed to prevent a continuation of such losses.

The wholesalers brought out in particular that it would be inadvisable to encourage extending credit to contractors whose methods of operations have resulted in unsound and dangerous financial situations; and that when instances of that kind occur it probably is due to the failure of the wholesaler to understand all of the facts and not through any desire on the part of the particular wholesaler to take an unsound financial risk.

Modernization

The representatives of both national associations agreed to urge upon their members active local participation in programs of rehabilitation, reconstruction and modernization, which are so essential today to the development of business in the face of the halting of new construction.

Among the subjects discussed and receiving favorable consideration from the conference were model ordinances recently drafted by committees of NECA and NEMA, for the protection of the public against the hazards of faulty materials and appliances and against improper and unsafe installation methods. These ordinances include sales control and reinspection.

It was the unanimous opinion of the conferees that, even though the immediate benefits of such joint conferences as this may appear intangible, their value will increase with their being held at frequent intervals and that due to the close relationship of the electrical contractors and wholesalers in the industry, such frequent conferences should be encouraged not only nationally, but by local groups throughout the country for the promotion of a better understanding of the problems of the industry as they affect the contractor and the wholesaler.

GENERAL ELECTRIC

RIGID CONDUIT

MERCHANDISE DEPARTMENT, GENERAL ELECTRIC COMPANY, BRIDGEPORT, CONNECTICUT

CONTRACTING news

INFORMATION OF INTEREST TO ELECTRICAL CONTRACTORS CONSISTING OF ITEMS OF NEWS, SHORT ARTICLES, PRACTICAL IDEAS, ETC., OUR READERS ARE INVITED TO CONTRIBUTE TO THIS DEPARTMENT

DEFEND CALIFORNIA LICENSE LAW

An organized attempt to arouse antagonism to the California contractors license law by charges that the registrar intended to seek to raise the yearly fees to $100, folded up and died recently when the construction industry, aroused, came solidly to the defense of the law. Instead of raising the fees, Glen V. Slater, assistant registrar of contractors, announced that possibly the fees during 1933 would be reduced to $7.50 from the present $10. Heads of various building groups such as builders exchanges, association presidents and executives, and entire organizations, such as the Electrical Contractors Association of Northern California spring to the defense of the contractors bureau and the licensing and regulation of contractors.

There has been a noticeable falling off of contractors seeking license each year since June, 1930, the highest number being 27,633. Last year the number had dropped to 25,050, and for the first two months of the new fiscal year which began in July, 1932, only 19,249 had registered. Of the 25,050 last year the number of electrical contractors was 1,679.

FAVORS USE OF SHORT-TERM TRADE ACCEPTANCES

By unanimous action of its board of managers, the National Electrical Credit Association has gone on record as favoring the general use of short-term trade acceptances from responsible customers in payment for goods sold, and the giving of trade acceptances in payment for goods bought.

These trade acceptances can be discounted at banks or sold to banks through note brokers. Banks receiving these trade acceptances will be urged to make a practice of rediscounting them with the Federal Reserve Banks, to the end that banks again may be placed in funds to make further extension of credit to industry and commerce.

CERTIFICATES OF MERIT FOR KENTUCKY CONTRACTORS

At the semi-annual meeting of the Kentucky Chapter, International Association of Electrical Inspectors, held at Louisville, January 11 and 12, it was decided by resolution to issue certificates of merit to electrical contractors whose methods, operations, etc., are recognized by the body as being worthy of recognition. Such certificates should prove of value to those holding them in displays in their office, in use on stationery, etc., through aiding in showing the public contractors who are recognized as able and reliable.

It was explained that contractors receiving the certificates will be under no obligation to the association, and the association will stand all of the expense of providing them. The set-up provides for an investigation of the contractor by an association committee, said committee to decide if past records and reputation warrant issuance of said certificate.

The contractor may or may not at his own discretion become a member of the association after receiving his certificate. Certificates will be issued annually and good for but one year.

In the resolution covering the plan of issuance of certificates the following conditions are set up:

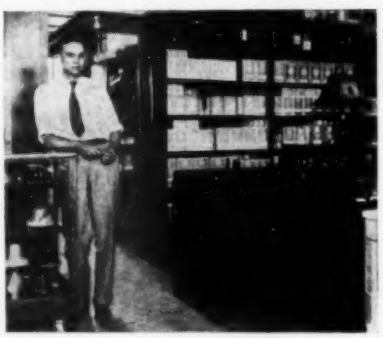
1—The contractor is not required to be a member of the Kentucky Chapter.

2—He must be 21 years of age and have at least two years of practical experience as an electrical contractor.

3—He must be recommended by at least five reputable individuals or concerns who have been acquainted with the applicant during the past two years.

4—He must have adequate working knowledge of the current edition of the National Electric Code and other local rules and ordinances.

5—This certificate is to be awarded not only because of his proficiency in the electrical industry but for his honesty, integrity and fair dealings with his associates and fellow man.



REMODELS PLACE OF BUSINESS: Chas. L. Kehl, always active in contractor activities in Green Bay, Wisconsin, recently did a good sized remodelling job on a department store in town and after that followed it up with a redesigned layout for his own store making the same amount of space do more work with the installation of steel shelving in the back of the store. He is also district executive committeeman for the Wisconsin Association of Electrical Contractors and Dealers.

EDISON ELECTRIC INSTITUTE SUCCEEDS N.E.L.A.

A new trade association of the electric light and power industry, called the Edison Electric Institute, and having a constitution which aims to abolish policies that in the past have subjected the industry to criticism was organized on January 12. It is expected that the National Electric Light Association which has for many years been the official body of the industry, and the Association of Edison Illuminating Companies, a national technical organization, will soon be dissolved.

The formation of this new body is looked upon as providing a definite answer to demands made by public utility leaders at the convention of the N.E.L.A. last June, that the industry divest itself of all semblance of propaganda activities, that it assume an attitude of frankness and ready cooperation in its dealings with the public and with regulatory bodies,

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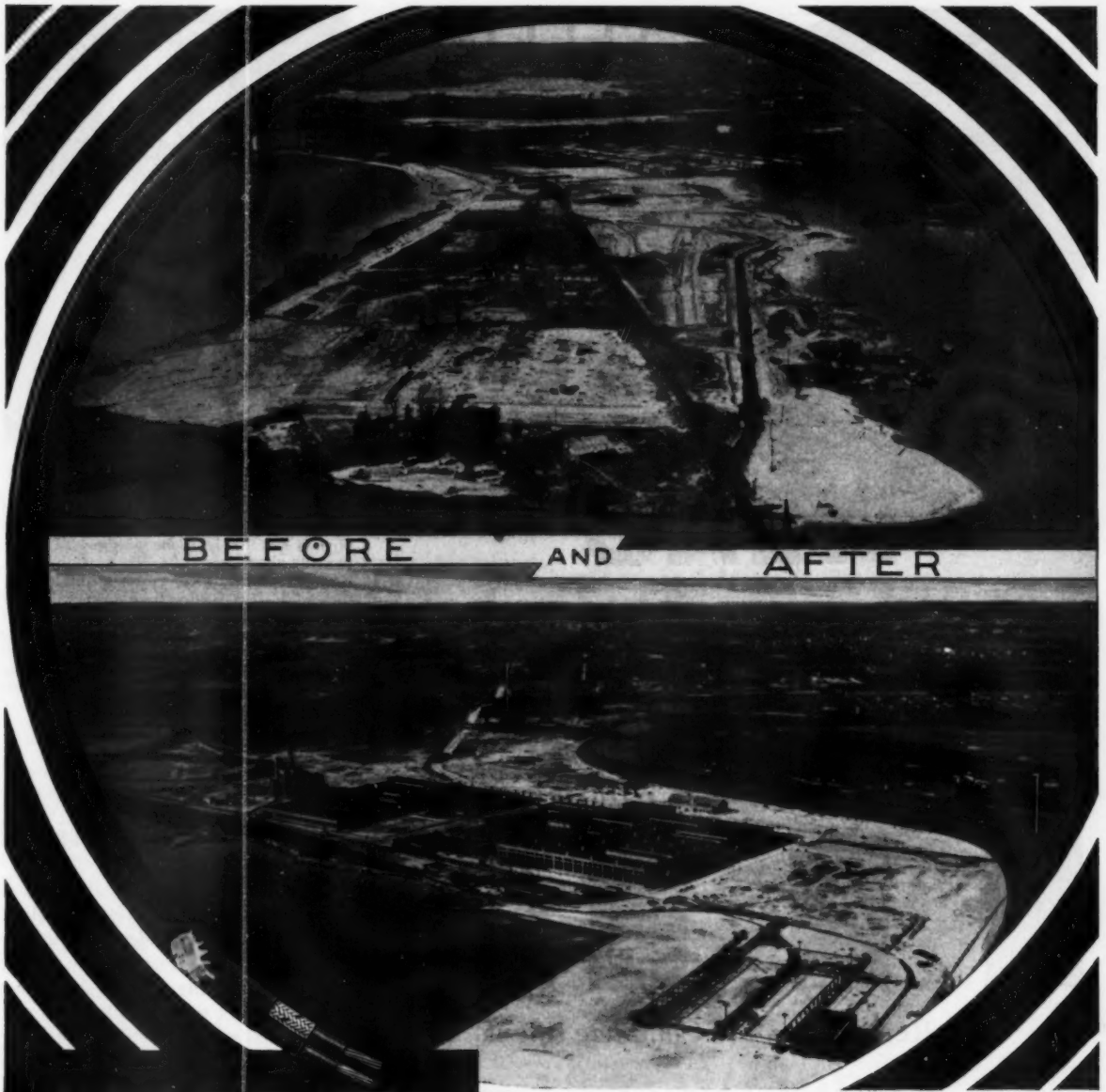


AMERITE 30% RUBBER COVERED WIRES

For An Investment of Millions

In the present building units in the mammoth plant of the Western Electric Company, Point Breeze Works at Baltimore, American Steel & Wire Company Amerite 30% Rubber Covered Wires were used throughout—thus safeguarding a large investment in electrical equipment with the highest type of wiring that engineering science has yet evolved.

The selection of Amerite 30% Wire was based on its excellent quality, constant uniformity and known dependability of its manufacturer. If you have a wiring job in the offing let us work with you on your wire requirements. Detailed information and estimates will be furnished promptly.

1831 MORE THAN 100 YEARS OF PROGRESS IN WIRE MAKING 1933

AMERICAN STEEL & WIRE COMPANY

208 South La Salle Street, Chicago — SUBSIDIARY OF UNITED STATES STEEL CORPORATION — And All Principal Cities

Pacific Coast Distributors. Columbia Steel Company, Russ Building, San Francisco — *Export Distributors:* United States Steel Products Company, New York

A SELLING OPPORTUNITY FOR THE KEEN CONTRACTOR

P&S DESPARD

The P&S-DESPARD Line of Wall Plate Merchandise offers you an easier way to sell wiring. You have something *new* to show—something to get *enthusiastic* about—something to *sell*. And, backed by P&S novel merchandising aids which have been prepared to assist you in "landing" those much-wanted re-wiring jobs, you can *get more business at better prices.*

P&S-DESPARD Combinations Will Help You Sell

And Remember, *the Complete line is*

APPROVED By

UNITED STATES TREASURY DEPARTMENT
UNDERWRITERS' LABORATORIES

▲

P&S-DESPARD Switches have also been given rigid tests on Type "C" gas filled lamp loads by the Electrical Testing Laboratories, Inc. and the United States Government Bureau of Standards.

▲

For Practical and Successful Methods of Selling Wiring Jobs

See Your Nearest P&S-DESPARD Distributor or Write to

PASS & SEYMOUR, Inc.
SOLVAY STATION, SYRACUSE, N. Y.

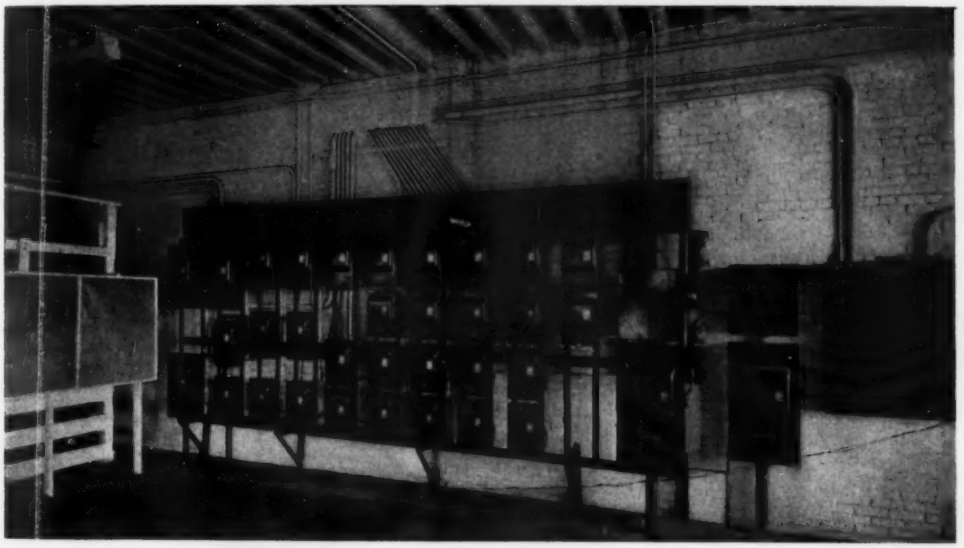
DOES AIR-PORT WORK: Bert LeBron, Omaha, Neb., did the electrical work on the Municipal Air-Port of that city and does most of the maintenance. This airport is not likely to be plunged in darkness as there are four ways of lighting: Regular power lines, motor generator on the field, B.B.T. floodlights operated by battery and should the latter go off due to battery trouble the second gas generator, ordinarily used for charging batteries could be hooked up direct with the lights. This is said to be the only field in the United States having four independent lighting systems.

that complete and frequent financial reports be made by all companies. It was urged at that time that such changes should be initiated within the industry itself.

The determination of the members of the Association to bind themselves to a rigid code of ethics is seen in a paragraph of the constitution which provides that "the membership committee, subject to the approval of the board of trustees and in accordance with resolutions which such board may from time to time adopt, shall have jurisdiction and authority to consider and investigate the business practices of any company member and to expel, suspend or take any other disciplinary action against any member guilty of a violation of proper or ethical business practices, or for failure to furnish information as required." It is stated that companies by virtue of becoming members of the Institute shall be deemed to have consented to the right of the Institute to impose such disciplinary action.

Other important provisions of the constitution are the following:

1. The company members shall from time to time and not less than annually publish financial statements, including balance sheets, showing gross and net income, operating expenses and surplus accounts, which statements shall



34-"CIRCLE T" TYPE "A" SWITCHES
AT THE MARSHALL CANNING CO., ROLAND, IOWA

Points of interest to Contractors

The Marshall Canning Company Plant is operated only a short season each year and while it is in operation, continuity of service is of extreme importance, therefore, adequate steps were taken to prevent interruptions under bad moisture conditions.

Each motor in the plant is controlled by one of the 34 Trumbull Type "A" Safety Switches on the rack and is wired from the switch to the control with individual conduit. Spaces were left on the rack for additional switches.

The 440 Volt, 3 Phase, underground service comes up through a 400 Amp. main switch in the lower right hand corner and through the metering current transformers in the cabinet directly above to the busses which are mounted in the steel trough shown on the top of the rack.

The water-tight buss trough is made of electric welded steel with the front sealed by gasketed covers.

Connection from the trough to each of the switches is made in conduit behind the switch. The conduits are arranged to drain into the bottom of the switches in which a small hole was drilled to allow all moisture to escape.

The utility metering equipment is mounted on the end of the rack at the right.

The electric welded steel frame switch rack is lagged to the brick wall so that in the future the customer can remove the temporary wood floor and pour a concrete floor without disturbing the rack.

To the right of the rack and mounted directly on the brick wall is the light switch and distribution cabinet. To the left of the rack is mounted a framed blueprint showing the location and number of each motor in the plant which corresponds to the number on the switch.

The ampere rating and fuse capacities in these motor circuit switches were chosen for short circuit protection only and each motor is provided with proper overload protection at the control.

The safety features of this type of panel using Trumbull Type "A" Switches appealed to the customer for the following reasons:

1. **Switches can be locked in either the "on" or "off" position.**
2. **Switches must be in the "off" position before cover can be opened.**
3. **Switches will break stalled rotor current of motors controlled without damage.**
4. **Fuses are replaced with the motor disconnected.**

Installed by Electrical Engineering & Construction Co., Des Moines, Iowa
Trumbull Switches sold by General Electric Supply Corp., Des Moines, Iowa

THE TRUMBULL ELECTRIC MFG. CO.
Plainville, Conn.

A GENERAL ELECTRIC ORGANIZATION

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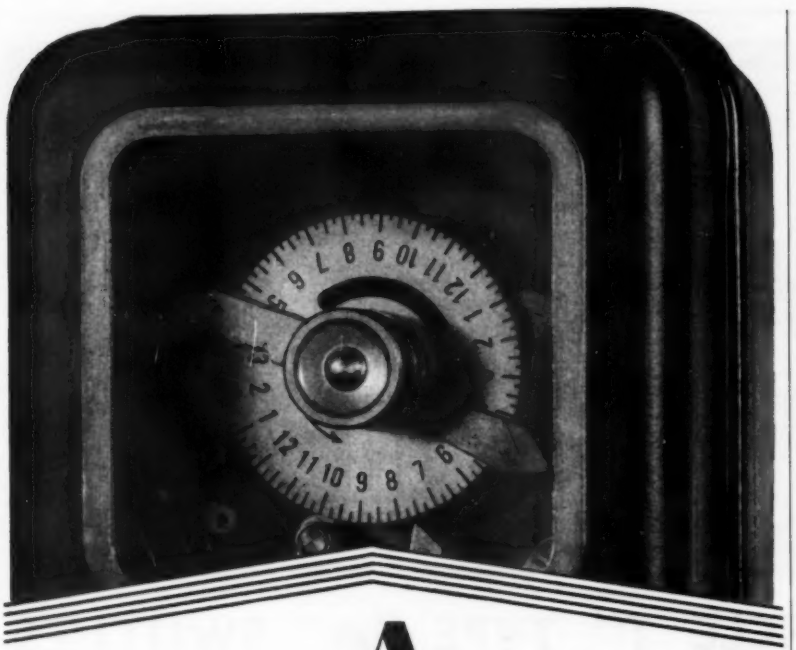


A low-priced TIME SWITCH THAT NEVER FAILS

Sangamo VW electrically wound and VS Synchronous motored Time Switches (A.C. only) while low-priced, are high in quality. They operate 100% efficiently—here's why—

1. **Electrically operated**
2. **40 ampere capacity**
3. **Revolutionary mechanical contact**
4. **Sunday and holiday cut-outs**
5. **Manual operation without disturbing the sequence**
6. **Dust-proof mounting**
7. **Pryouts at back and bottom**
8. **Fully guaranteed by Sangamo**

Ask your jobber for a Sangamo when you need a Time Switch. The line is complete and can be secured from jobbers in every city of 50,000 or over.

Sangamo also make a complete line of Flashers and Chasers.

SANGAMO ELECTRIC CO.
SPRINGFIELD, ILLINOIS

be certified to by independent firms of certified public accountants who shall have audited the books of the company.

2. All statements and data furnished to consumers, stock exchanges and stockholders; all information designated for public dissemination and all reports to governmental authorities shall be accurate and clearly indicate their source.
3. All contracts between any member companies which involve the furnishing of management, supervisory, purchasing, construction, engineering or financing services to operating electric utility companies shall be so drawn and so operate in practice that the charges to the operating company shall be reasonable and commensurate with the value of the services rendered and the fair cost thereof to the company furnishing the services.
4. Company members from time to time shall answer such questionnaires relative to their organization, financing, methods of operation and business practices as may be requested by resolution of the Board of Trustees.

The objects of the Edison Electric Institute are:

1. The advancement in the public service of the art of producing, transmitting and distributing electricity and the promotion of scientific research in such field.
2. The ascertainment and making available to the members and the public of factual information, data and statistics relating to the electric industry.
3. To aid its operating company members to generate and sell electric energy at the lowest possible price commensurate with safe and adequate service, giving due regard to the interests of consumer, investor and employee.

The membership is divided into four classes: operating company members, holding company members, individual members who will be officers or employees of company members, and honorary members.

NO COMPETITION: Fred Beamer has the only electrical store and shop in Golden, Colo., and as he says opportunities are limited—but so is competition. He came here several years ago with only a few dollars. Now he has a well balanced business of wiring, radio sale and repairs, ranges, battery work, etc.

SAFE
Electrical Cords
CARRY THIS LABEL
UNDERWRITERS LABORATORIES INSP. CORD

QUALITY TAPES
MAKE QUALITY JOBS

General Electric Friction and Rubber Tapes are made in a variety of types and sizes to meet every electrical requirement. These high quality tapes assure you of the most efficient results regardless of the difficulty of your job. Permanent adhesion, lasting protection and economy are features which give satisfaction and greater service.

Order these tapes from your nearest G-E Merchandise Distributor. He stocks a complete line and can give you prompt service and immediate delivery. Or, write Section M-202, Merchandise Dept., General Electric Company, Bridgeport, Conn.

GENERAL ELECTRIC
TAPES

MERCHANDISE DEPARTMENT, GENERAL ELECTRIC COMPANY, BRIDGEPORT, CONNECTICUT

UMI

MURRAY
SAFETY SWITCHES

SKY HIGH QUALITY

EMPIRE STATE BUILDING
Fifth Avenue and 34th St.
New York, N. Y.

SHREVELAND & HARMON
Architects

MEYER, STRONG & JONES
Consulting Engineers

L. K. COMSTOCK & CO., Electrical Engineers

Murray Transformer and Metering Equipment Installed Throughout

METROPOLITAN
DEVICE CORPORATION
1250 ATLANTIC AVENUE
BROOKLYN · NEW YORK

CONNOLLY GOES WITH A.G.A.

Frank J. Connolly, since 1929 executive secretary of the California Electragists, Southern Division, and its successor, the Electrical Contractors and Dealers Association, has been made manager of the Southern California Chapter, Associated General Contractors.

The Electrical Contractors and Dealers' Association of Southern California will continue for the time being without a paid secretary, managed by its executive committee until business conditions warrant a full-time secretary again.

CHANGES NAME OF DETROIT CHAPTER

At the annual meeting of the Detroit Chapter of Electragists, held on January 10, it was voted to change the name of the local association to the Detroit Electrical Contractors Association.

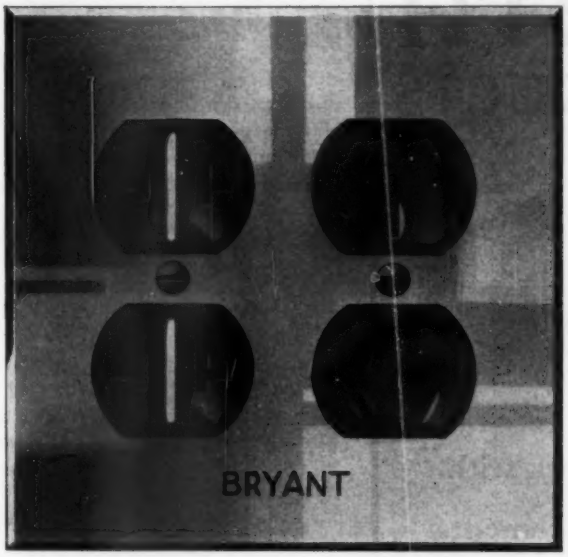
The new officers elected for 1933 are George Jacob, president; E. D. Brown, vice-president; W. D. Gale, treasurer and C. C. Cadwallader, secretary. The board of directors are George Jacob, E. D. Brown, Murry Ansel, John Shoebottom and F. M. Hydon.

NEW CODE FOR CINCINNATI

Revision of Cincinnati's Building Code, a seven-year task, has been completed. The new Code will go into effect April 1, 1933. The Electrical Section (Chapter 14) has taken as a basis for its regulations the provisions of the 1931 National Electrical Code.

It becomes mandatory under the revised Code that all electrical installations be inspected and approved by the Commissioner of Buildings, or a Bureau appointed by him. For upward of fifty years, inspections in Cincinnati and surrounding territory have been made through the Ohio Inspection Bureau, and it is expected that this arrangement will be continued.

A very representative committee from the Electrical Industry was appointed by the Commissioner of Buildings to draft Chapter 14. The personnel of this committee was as follows: Carl Kiefer, consulting engineer, Charles M. Beltzhoover, electrical contractor and Frank H. Schutte, chief electrical inspector.



TWO WIRE THREE WIRE

Standard Two-Gang Duplex Receptacle Plate

THE new Bryant Duplex Three-Wire Polarized Flush Receptacles take standard duplex receptacle plates (Bryant V section). This allows their use in brass combination and mutiple gang plates, just like standard two-wire duplex receptacles.

There is a definite trend toward the use of three-wire, polarized devices in industry and the home. Safety considerations demand a grounded terminal for most appliances.

The combination illustrated above is recommended especially for home laundries where there is unusual danger to life if there is any short circuit in the motor or wiring. The washing machine and ironer should have three-wire cords with Bryant No. 9112 or No. 9111 caps to plug into the three-wire duplex receptacle. With the third terminal of the receptacle grounded by a third wire, or through the pipe of a metal conduit installation (use No. 4327) the exposed parts of the washing machine are kept at ground potential. The two-wire receptacle can then be used for any appliance equipped with two-prong caps which may be temporarily brought into the laundry room.

Bryant Duplex Three-Wire Polarized Flush Receptacles used with Bryant No. 9112 or No. 9111 caps or other standard three-wire caps assure a perfect ground. The ground circuit is made before the load circuit is completed and it is unbroken until the load is removed.

NEW 3-WIRE POLARIZED FLUSH RECEPTACLES

FOR

STANDARD DUPLEX RECEPTACE PLATES

National Electrical Code Standard

15 Amperes 125 Volts
10 Amperes 250 Volts

No. 4326
Brown Templus
Side Wired

No. 4327 is similar except it has a grounded yoke.

Add PE to Catalog Numbers if desired with plaster ears.

Bryant Duplex Three-Wire Polarized Flush Receptacles accommodate two Bryant standard size or pony caps at one time, even though the caps have cord-grips. See page 57, Catalog No. 30, for caps and other devices in this line.

BRYANT BRYANT SUPERIOR WIRING DEVICES

SUPERIOR WIRING DEVICES

EW-233 Manufactured by THE BRYANT ELECTRIC CO., BRIDGEPORT, CONN.

MANUFACTURERS OF "SUPERIOR WIRING DEVICES" SINCE 1888—MANUFACTURERS OF HEMCO PRODUCTS

BOSTON 140 Federal Street ... CHICAGO 844 West Adams Street ... NEW YORK 60 East 42nd Street ... SAN FRANCISCO 149 New Montgomery Street

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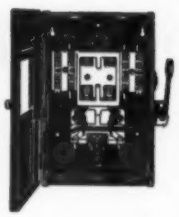
WADSWORTH
ELECTRICAL PRODUCTS



SAFETY Electric Switches and Distribution Panels

A product you will like to work with.

They meet all electrical requirements and can be installed with less trouble.

"D-tach-O"

Here is a product that offers many decided advantages in Display Case Lighting, that opens the door for more and profitable Wiring Jobs.

Why not take advantage of the many opportunities for replacement or new installations existing in your territory.

Your jobber or our representative will be glad to work with you.

The WADSWORTH ELECTRIC MFG. CO. INC.
Covington, Kentucky

The Cincinnati Electrical Contractors' Association was instrumental in embodying several special provisions into the Code.

In the chapters which pertain to the structural requirements of various types of buildings, such as churches, non-resident clubs and lodge buildings, school buildings, public buildings, penal, hospital and institutional buildings, special hazard buildings, moderately hazardous buildings, dwellings, accessory buildings and miscellaneous structures, special regulations governing electrical installations have been incorporated. Under the new Code, electrical installations which involve wiring for illumination will be approved, only when outlets are located in accordance with requirements of the chapters (5, 7 and 12 of the Building Code) pertaining to the type of building in which the installation is made.

ELECT OFFICERS AT ANNUAL MEETING

The following officers were elected to serve for 1933 at the annual meeting of the Milwaukee (Wis.) Chapter of the National Electrical Contractors Association, held December 20, 1932: George Magaw, president; Walter Rohn, vice-president; William Sorgel, secretary-treasurer, and Bruno Barg and H. C. Adolphsen, directors.

The meetings scheduled for 1933 are to be held the third Tuesday in March, June, September and December.

CANADIAN APPROVED LIST

The October, 1932, list of electrical equipment approved by The Hydro Electric Power Commission of Ontario is now available. It is known as "Second Edition—Supplement 'E'."

TO CURB "FLOATING MASTERS"

A new ordinance incorporating strong restrictions to what is known as the "floating master" electrician and curbing the maintenance man or jack of all trades, has been passed in the city of Glendale, Cal. It also requires that merchandise offered for sale bear Underwriters' Laboratories approval or listing. It prohibits bidding on work without a license, holds that repair for compensation of any electrical portion of an appliance or material requires a contractor's license, exempts sole owners of prop-

IOWA STATE TEACHERS COLLEGE
POWER PLANT & SHOPS BUILDINGS,
CEDAR FALLS, IOWA

Architect—E. E. Cole, Cedar Falls, Iowa. Electrical Work—John F. Swope, Elec. Supt. for College. 25,000 feet of Steeltubes, ½ to 2" inclusive, used. Material furnished by Westinghouse Electric Supply Co., Waterloo, Iowa.

STEELTUBES

"... A STEP FORWARD IN THE ELECTRICAL INDUSTRY"

THESE are not our words. Mr. John F. Swope, Electrical Superintendent, Iowa State Teachers College, Cedar Falls, Iowa, upon completion of the Power Plant and Shops Buildings, in which Steeltubes Conduit was used exclusively in all sizes from ½ to 2-inch, expressed this opinion. The use of 25,000 feet of Steeltubes in these buildings proved to him that this threadless rigid conduit represents "the most economical and modern method of conduit installation."

Every contractor knows that antiquated products and old time methods will not make profits in 1933. Buyers are looking for greater values and lower costs, and the contractor progressive enough to recognize this demand and smart enough to satisfy it will get business—and make money.

Steeltubes—the modern threadless rigid conduit—is a business builder. Light—easy to bend—easy to install—only three simple types of fittings for any job—and no threads to cut. Broad code approval—meets Government specifications.

If you haven't used Steeltubes, let us send you a sample coupled joint. Play with it for three minutes and its profit possibilities will convince you.

ELECTRICAL DIVISION
STEEL AND TUBES, INCORPORATED
World's Largest Producer of Electrically Welded Tubing
CLEVELAND » » « « OHIO
A UNIT OF REPUBLIC STEEL CORPORATION

THE MODERN THREADLESS RIGID CONDUIT
Steeltubes

UMI

FRINK ILLUMINATION

Central National Tower, Battle Creek, Mich.
Holabird & Root, Architects.

MODERN BANK ILLUMINATION

This unretouched photograph shows perfect illumination without glare or spotting.

The large banking room is illuminated in the modern manner—extruded metal ceiling strips supplemented by illuminated balcony fronts. Complete details on request.

THE FRINK CORPORATION
23-10 BRIDGE PLAZA SOUTH
Long Island City, N. Y.

In actual comparison, Fretz-Moon Conduit bends 25% easier than ordinary rigid conduit. It also bends freely to any requirement without distortion, flattening at the bend, opening at the weld, scaling of the galvanizing or cracking of the glass-like enameled inner surface.

All three Fretz-Moon brands are free-bending—ENAMELITE, black enameled; ELECTRO GALVITE, electro-galvanized; HOT DIPPED GALVITE, hot galvanized by a special process.

FRETZ-MOON TUBE CO., INC.
BUTLER, PENNA.

FRETZ-MOON
RIGID CONDUIT

erty from license, requires that master electricians must be members of a contracting firm, requires notarized listing of firm personnel of officers, provides for examination of master electricians and journeymen.

Examination fees set up are $10 for a maintenance man, $2.50 for yearly renewal, and no license fee. For change of employment a new examination is required. Contractor's license is $100, with a $50 renewal and a $500 surety bond.

1933 OFFICERS

At the annual meeting of the Columbus (Ohio) Chapter of the National Electrical Contractors Association, held December 20, the following officers were elected: Paul L. Gilmore, president; Charles Gemeinhardt, vice-president; W. H. Rogers, secretary-treasurer, and Ed Evans, Merle Brooke and H. L. Pence, directors.

PROPOSE REGISTRATION OF INSPECTORS

A move to place registration of building, electrical, plumbing and other similar inspectors under the department of professional and vocational standards of the State of California, in a similar manner to the registration of physicians, engineers, and contractors has been initiated by the Pacific Coast Building Officials Conference.

JACOB TELLIER

Jacob Tellier, secretary of the Herman Andrae Electric Company, Milwaukee, Wis., died on January 4 at the age of 62.

Mr. Tellier was a pioneer in the field of electrical construction, starting in 1888 with Julius Andrae. He installed the generators and power equipment in most of the old breweries, malt houses and industrial plants in Milwaukee and supervised the electrical work in dozens of U. S. postoffices.

His influence locally in electrical work was large, as he had working under him at some time or other a large percentage of all the wiremen, inspectors and electrical contractors of Milwaukee.

Ever since the national movement for accident prevention started in Milwaukee in 1912 Mr. Tellier has been active in its promotion.

NET PROFITS— THE KEY TO 1933

Here are several practical suggestions for increasing your PROFITS during the coming year.

SELECT YOUR JOBS

Learn to go after jobs that you are equipped to handle successfully—you may feel capable of greater things, yet many successful contractors never figure the *"big jobs"* for they know their limitations and waste little or no effort on jobs that are too large or too lean.

DON'T FOOL YOURSELF

Many contractors seem to think that by increasing their volume they automatically add to their profits. It's human to strive for more business, but contractors who have come through these trying times realize as never before that PROFIT is the only thing that kept them in business—reduced volume may be a blow to pride, but profit heals all wounds.

A PROFITABLE PARTNER

One contractor says, "We would be able to pay our bills now if we had begun using your Service when we started in business." If you have been dissatisfied with your profits, don't dismiss the profit possibilities of THE NATIONAL ELECTRICAL RESALE PRICE SERVICE as "Your Silent Partner" until you have investigated. Simply attach the coupon below to your letterhead and full information will be sent to you.

Henderson-Hazel Corporation,
5005 Euclid Avenue,
Cleveland, Ohio.

Gentlemen:

Without obligation please send us your booklet, "Profit—Your Silent Partner."

Name.....

Address.....

City..... State.....

E.C.-2-33

UMI

"Sell 'em" with Wiremold!

How Wiremold Will Help Every Contractor Get More Business

"Quick sales at a fair profit! Small jobs—but plenty of them! Easy, simple installations that the customer can pay for—but which keep you and your workmen busy in the shop and on the job!"

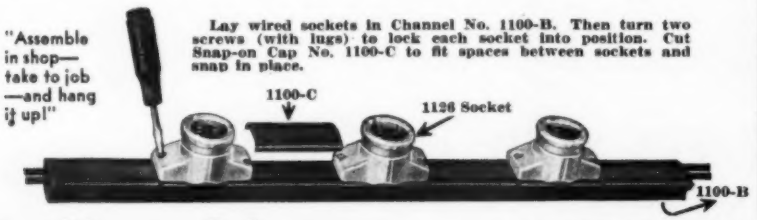
That's why Wiremold Lighting Strip meets the need of the moment. A made-to-measure window lighting job exactly suited to each merchant's requirements, that can be assembled in the shop and taken to the job and hung in place! (Can also be made portable—a great selling point!)

You can sell 'em with Wiremold Lighting Strip!

Wire No. 1126 sockets at desired distance apart.

It gives you a profit on labor as well as material—and tickles the customer besides.

Get busy! There is business to get—if you go after it!


"Assemble in shop—take to job—and hang it up!"
Lay wired sockets in Channel No. 1100-B. Then turn two screws (with lugs) to lock each socket into position. Cut Snap-on Cap No. 1100-C to fit spaces between sockets and snap in place.
1100-C
1126 Socket
1100-B

THE WIREMOLD COMPANY HARTFORD, CONN.

PORTABLES *that meet every requirement*

The eight portable lamp guards pictured here present only a portion of the extensive McGill portable guard line.

McGill Portables designed to meet every imaginable need, bring directed and protected light to **every job and every worker.**

McGill Portables perform a multiple duty; they guard light bulbs against breakage, and guard workers from the danger of serious injury. They protect workers from strain due to improper lighting conditions, and protect your invested dollars against unnecessary losses... Write for our interesting catalog describing the entire McGill line of portable lamp guards.

McGILL MANUFACTURING CO.
Electrical Specialties of Quality
ESTABLISHED 1904
VALPARAISO · INDIANA
Box No. 670

A ROLL O' TAPE

ELECTRICAL FLASHES GATHERED AMONG THE BIG WIRE AND PIPE MEN BY ELECTRICAL CONTRACTING'S FIELD EDITORS

CORNELIUS F. COLLONAN, electrical contractor-dealer, was recently appointed a member of the City Planning Commission by Mayor Rossi, of San Francisco.

THE Bliss Electric Company, St. Petersburg, Fla., asks every new customer how he happened to hear of the firm. Almost without exception the answer is: "I saw your ad in the telephone book."

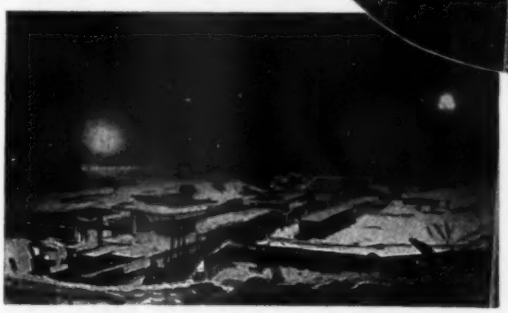
A FORT WAYNE contractor sent 100 letters to homeowners suggesting a home inspection to determine the efficiency of their wiring system. He received only one reply. Then he called these 100 home owners on the phone and this type of contact brought him 30 inspections. Out of these 30 inspections he secured 6 home remodelling jobs.

R. P. ECKSTEIN of Columbus, Ohio, has built a trailer on which is mounted a lamp standard for the demonstration of flood lights. When not busy with other work, he plans to canvass the territory around Columbus for this type of work, particularly on gas stations. The plan is to leave this standard and light at a station that seems to be a logical place and call a couple of days later for the decision on a permanent installation. Where the prospect lacks ready cash the light company will consider financing.

THE Electric Supply Company, Zanesville, Ohio, runs daily ads in the classified section of the newspaper. They carry a complete stock of repair parts for several makes of washers and knowing that many people like to have the name of a competent repair man for their machine they name some machine at the beginning of the ad. For instance "EASY washers repaired promptly. Wringer rolls and parts for all makes." Simple, short ads like this are inexpensive and proven result getters for this contractor.

NOW is the time to prepare for Spring Floodlighting

Plan to Take Advantage of These Profitable Opportunities



Baseball

SPRING practice is under way. For many of the minor league teams, the outlook is rather gloomy. The floodlighting of baseball fields for night play, however, has been proved as a method of increasing gate receipts. This year, many of the people who can afford to attend the games are busy during the day; night games are therefore the logical solution. The baseball diamonds in parks and schools also offer an opportunity for floodlighting.

Construction

Soon spring construction projects will start. In order to take advantage of favorable weather or to finish a rush job on time, it will be desirable to work night and day. Floodlights will give adequate illumination for safe, fast work. Even if work is not done at night, floodlights are necessary to protect materials and property from theft and damage.

Floodlighting for Advertising

To prepare for the annual spring increase in traffic, advertising signs and displays of all kinds should be lighted up. Drive along the main roads around your community and notice the smoke stacks, billboards, signs on buildings and stores, roadhouses and displays that might be lighted for advertising purposes.

General Electric floodlighting engineers will gladly help you plan any unusual or complicated applications or answer questions which may arise in the course of any installation. Address the nearest office of the G-E Supply Corporation; any other G-E Merchandise Distributor; any G-E Sales Office; or General Electric, Schenectady, N. Y.

YEAR-AROUND POSSIBILITIES FOR FLOODLIGHTING

Buildings • Factories and Industrial Areas • Construction Work • Parking Areas • Filling Stations • Outdoor Sports, Winter and Summer • Playgrounds • Swimming Pools and Beaches • Residences, Grounds, and Gardens • Fairs, Pageants, and Race Tracks • Signs, Billboards, and Advertising Displays • Farm Buildings and Yards • Roadside Stands • Natural Scenery in Parks and Estates.

710-169

GENERAL ELECTRIC

WHY G-E TIME SWITCHES?

BECAUSE every detail of the T-13 has been engineered toward producing a time switch that will operate year after year without trouble, maintenance, or inspection. It combines the widely known Telechron motor and the mercury-to-mercury contact Kon-nec-tor—the switch that never wears out in service. Thousands of installations are proving the extraordinary dependability of the T-13. It is accurate, reliable, simple, economical, widely adaptable, and requires no oiling or winding—yet, with all this, moderately priced.

621-30

GENERAL ELECTRIC

MAIL THIS COUPON FOR COMPLETE INFORMATION AND PRICES

Address: General Electric Co., Schenectady, N. Y., Room 307, Bldg. No. 6.

Name.....

Firm.....

Address..... EC-2

Manufacturers News

NEW WEST COAST SALES REPRESENTATIVE

Effective January 1, Zinsmeyer, Inc., located at 717-23 Mateo St., Los Angeles, Calif., will represent the Frank Adam Electric Co., Diehl Manufacturing Co., and Major Equipment Co. exclusively in the states of California and Arizona, and will carry factory warehouse stocks of all three lines.

The officials of the new company are E. Zinsmeyer, president; L. H. Wiltse, vice-president; M. Zinsmeyer, secretary; W. Zinsmeyer, treasurer, and J. D. Land, district manager, located in San Francisco.

Prior to this time E. Zinsmeyer, for the past 32 years, was associated with the Frank Adam Electric Co., St. Louis, Mo., serving in the capacity of cost clerk, draughtsman, salesman and sales manager. During the past seven years Mr. Zinsmeyer was vice-president in charge of the Pacific Coast.

L. M. DUNN

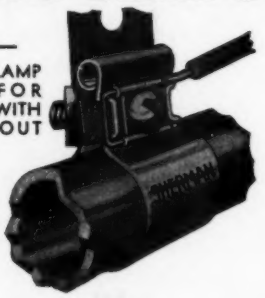
Leo M. Dunn, vice-president, Graybar Electric Company, died on January 20. Mr. Dunn's early work was in the operating end of the telephone business. In 1910 he went with the Western Electric Company and after a series of promotions he became general merchandise manager in 1923. When the Graybar Electric was formed in 1926, Mr. Dunn was made a vice-president.

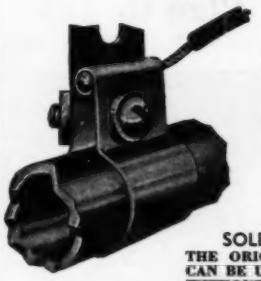
Van Cleef Bros., Chicago, Ill., announces the appointment of W. E. Phinney, a manufacturers' agent, as sales representative covering the New England states. Mr. Phinney is located at 592 Beacon St., Boston, Mass.

Catalog No. 100, covering commercial type equipment, including indoor type disconnecting switches, bus clamps, bus supports and "steelcubes" has just been published by Powercraft Corp., St. Louis, Mo. Catalog contains full description of units, together with photographs and blueprint diagrams showing typical instal-

SHERMAN GROUND CLAMPS

SL TYPE—
THE ONLY CLAMP APPROVED FOR USE EITHER WITH OR WITHOUT SOLDERING





ALL COPPER ONE PIECE
U. S. Patent No. 1241898

SOLDER TYPE
THE ORIGINAL TYPE—CAN BE USED WITH OR WITHOUT SOLDERING BUT APPROVED FOR SOLDERING ONLY.

SEND FOR LITERATURE—BUY FROM YOUR JOBBER

H. B. SHERMAN MFG. CO.
BATTLE CREEK • • MICHIGAN

MINERALLAC PRODUCTS

1. 2.

HANGERS FOR CABLES & CONDUITS

Easily the best for quick, low-cost installation work. Send for full details and costs.

1 Hanger without Porcelain Bushing. Spring steel; stronger, quicker, more compactly arranged.

2 Hanger attached to steel beam with bolt and nut.

3 Jiffy Clip—quicker, neater work at less cost.

4 Cable Joint or Pothead Compound—8 grades for every system, underground or overhead.

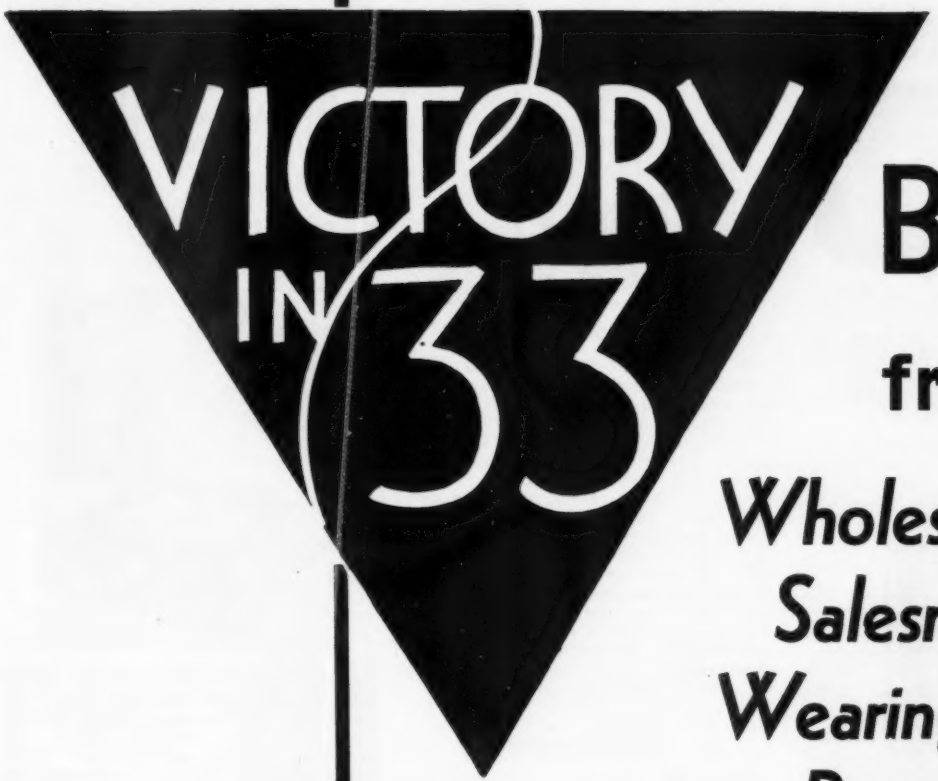
3.

JIFFY CLIPS

4.

Insulating Compounds

MINERALLAC ELECTRIC CO.
25 North Peoria Street, Chicago, Ill.



It pays to Buy from *Wholesaler's Salesmen Wearing this Button!*

Wholesalers' salesmen who have earned the right to wear the "Victory in '33" emblem are the men who are interested in helping contractors increase their sales and profits in 1933. It will pay you to buy from these men.

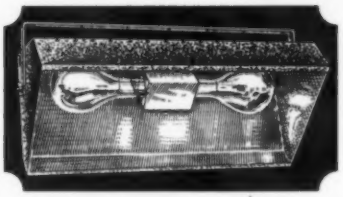
For complete information write to

ELECTRICAL WHOLESALING
(ESTABLISHED 1920)
520 No. Michigan Ave., CHICAGO
330 W. 42nd St., New York, N. Y. 501 Guardian Bldg., Cleveland, Ohio

February New Products

Adjustable Window Units

The Wadsworth Electric Mfg. Co., Covington, Ky., announces adjustable units in two sizes for show window light-



ing. Some of the features of the units are Swedish iron housing, and individual self-aligning louvres and color screens, with which diffusing glass can be used.

Farm Water Heater

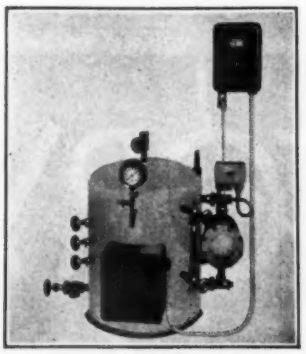
A portable immersion heater for farm use, and for heating water on location where it is desired is announced by Edwin L. Wiegand Co., Pittsburgh, Pa.

Heater is provided with a rubber-covered heater cord which may be disconnected at top of heater. Heating element, which is rated at 1300 watts for 115 volt, is located in a large round doughnut-shaped section at bottom. Heater is nickel-plated and has a capacity of 10 gallons.

Radio Noise Eliminator

Amy, Aceves & King, Inc., New York City, announces the AKAformer kit, for eliminating radio noises, consisting of

two transformers, one attached to the aerial, the other to the radio receiver, applicable to any antenna or receiver. Kit contains 50 ft. of shielded cable.



Electric Steam Boiler

A line of full-automatic electrically heated steam boilers for use where process steam is required in small or moderate volume at pressure of from 200 lb. downward is announced by Commonwealth Electric & Mfg. Co., Boston, Mass. Standard models range from 25 kw. to 90 kw. in rating, operating voltages being either 110-125 or 220-250. Unit has magnetic switch mounted on wall, tumbler switch for starting, mercoid automatic pressure controller, and General Electric heating units. A heavy sheet-steel junction box with hinged door and knockouts is welded to boiler over heaters. By turning a switch user may produce this process steam electrically, in the exact quantity necessary.

Midget Megger

A midget "Megger" tester has been placed on the market by James G. Biddle Co., Philadelphia, Pa. The overall dimensions of this tester are 5¼ by 4 by

2⅛ in. and it weighs 3 lbs. Tester consists of a true ohmeter, direct-reading like a voltmeter, combined with a special d.c. hand generator. Scale reads as high as 20 megohms and generator supplies testing current at 500 volts. Spring plunger-type terminals for rapid attachment and disconnection are provided. Case is molded in synthetic resin with smooth exterior.

Antenna System

The Clough-Brengle Co., 1134 W. Austin Ave., Chicago, announces its staticlear balanced antenna system, designed to permit erection of an antenna at a point free from interference and to carry the desired signal to receiver through a balanced transmission line.

The balanced transmission line eliminates shielded wire lead ins. Two radio frequency transformers, each of different design, prevent reflection losses by matching antenna and receiver input impedances to balanced transmission line. The complete unit includes one type ANT-1 R.F. transformer, one type REC-1 R.F. transformer, 75 ft. of two-wire transposed transmission line, and complete mounting hardware.

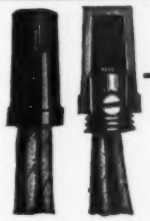
Humidifier

A portable home humidifier with a 6 gal. evaporation capacity per 24-hour day is announced by The Emerson Electric Mfg. Co., St. Louis, Mo. Operating

mechanism is a single unit including water bath, fan motor and humidifying discs. Unit fits into a console cabinet, 28 by 24½ by 15 in. in size. Cabinet finish is American Walnut with an aluminum grill work. Unit has a 50 watt 110 volt a.c. motor and a rubber belt drive. Drain plug is provided in bottom of reservoir for draining and cleaning.

"MEASURE MARKED"
NON-METALLIC FLEXIBLE CONDUIT
"MEASURE MARKED"
"SX" NON-METALLIC SHEATHED CABLE
METALLIC FLEXIBLE CONDUIT
"AX" ARMORED CONDUCTOR

STOCKED BY LEADING JOBBERS



The MARR
Only insulated wire connector with brass binding screw contact
Approved

for
FREE
SAMPLE
Write to
THE RATTAN MFG. CO.
New Haven, Conn.

General Sales Agents
HATHEWAY & CO.
220 Church St., New York City

"Standardize on STANDARD Transformers"

ALL TYPES
Indoor and Outdoor Service

Send for Descriptive Bulletin

STANDARD TRANSFORMER CO.
Warren . . . . . Ohio

FLOOR BOXES
ORDER
"Latrobe"
CARRIED IN STOCK
BY OVER 300 DISTRIBUTORS
Fullman Manufacturing Co.
LATROBE, PA.

lations. Price-lists are also included. Catalog is in loose-leaf form so that pages may be added from time to time.

Electric Service Supplies Co., Philadelphia, Pa., has just published Bulletin No. 340, covering its Golden Glow and Keystone floodlighting equipment. This catalog contains descriptions and illustrations of various types of projectors, lenses, reflectors, color screens, louvres, visors, floodlights and miscellaneous parts for these units. In addition to illumination data, diagrams and price-lists, the catalogs contains photographs of different installations where these floodlights and projectors are used.

The Wiremold Co., Hartford, Conn., has just issued a booklet on lighting strip, which is illustrated with diagrams showing how to install this lighting strip, together with prices and sizes.

A bulletin completely illustrating and describing Steel City electric sign flashers has been published by Steel City Electric Co., Pittsburgh, Pa.

Ivanhoe Division of the Miller Co., Meriden, Conn., has published catalog No. 824 covering Ivanhoe ultra-violet lighting equipment for commercial, industrial and residential use. Ivanhoe duo-purpose lighting fixtures and utility ultra-violet lighting equipment are described, together with installation diagrams and price-lists. Catalog contains photographs of installations of Ivanhoe units.

The Trumbull Electric Mfg. Co., Plainville, Conn., announces the appointment of Elmer T. Carlson as sales manager of their panel board and switchboard plant at Ludlow, Ky. Mr. Carlson replaces M. J. Kallaher, who recently resigned.

A pamphlet describing the "Linc-Weld" type D motor, containing illustrations and dimensions has been issued by the Lincoln Electric Co., Cleveland, Ohio.

Classified Advertisement

Position Wanted: Reliable electrician desires permanent position. Has had 13 years' experience covering all types of construction and maintenance work, capable of handling men. Will go anywhere. Will furnish good references. Box 233, Electrical Contracting, 520 N. Michigan Ave., Chicago, Ill.

Approved by National Board of Fire Underwriters and the Mutual Laboratories

Ideal Wire Connectors Help You Get Business

Over ten thousand progressive electrical contractors have learned that through the economy of Ideal Connectors more business can be had.

Ideal Wire Connectors screw on like a nut; they eliminate expensive taping and soldering work. They make a better insulated electrical joint. They help you get more business.

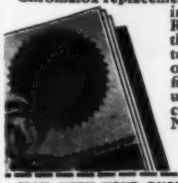
IDEAL WIRE CONNECTORS

Ideal Commutator Dresser Company
1041 Park Avenue Sycamore, Ill.

New easy way to make EXTRA MONEY

"We sold 15 elements the first week—we have installed Chromalox in nearly every stove in the city using open type elements," writes Correll Electric Co., Linton, Ind.

GO AFTER REPLACEMENT RANGE UNIT ORDERS with Chromalox Units Clapp & Leach sold 54 units in 4 weeks. Altoona, Pa. dealer made $136.50 in 2 months. Richmond, Va. contractor sold 48 units in 4 months, made $187.20 profit. Chromalox replacement units are a money-making depression-proof item. Range owners want to buy them. Easy to install, sizes to fit every make of range, old or new. Write for sure-fire sales plan already in use by dealers; Liberal discounts; free sales helps, etc. No obligation.



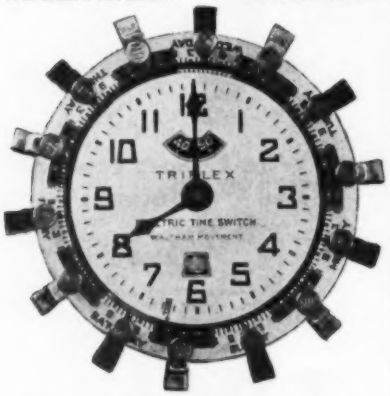
You can do it, too!

MAIL WITH YOUR BUSINESS LETTERHEAD TODAY!
E. L. Wiegand Co., 7585 Thomas Blvd., Pittsburgh, Pa.
Without obligation, send us complete data about Chromalox Super-Speed Replacement Range Units and how we can make money selling them. There are approx. ..... elec. ranges in the territory we serve. Check which ( ) We sell elec. ranges ( ) We do not sell elec. ranges. ( ) Send us catalogs about Chromalox-equipped electric ranges.

Signed.....Position.....

TRIPLEX
TIME SWITCHES

Waltham Movement *Mercoid Switch*



WEEKLY PROGRAM DIAL

Above illustration shows daily divisions of rotating rim which makes one revolution in 7 days.

The rim is equipped with 7 sets of ON & OFF clamps quickly set for any daily schedule.

Operations may be omitted between a particular time on one day and the desired time on any succeeding day.

The Weekly Program Dial is furnished, when specified, with any type Triplex Time Switch.

Mercoid Thermostat

Illustration shows low voltage Dual Type with 2 thermostats in one instrument. 110 volt types also available.

Type illustrated includes Weekly Program Dial and Mercoid Relay mounted in time switch housing. When connected to a thermostat, this device will automatically change the temperature control to meet day and night, and weekly heating requirements. Also furnished with regular 24 hour dial.

Write for Bulletin No. 34 descriptive of above types, also regular types for control of electrical illumination.

TRIPLEX PRODUCTS
Chanin Building New York, N. Y.

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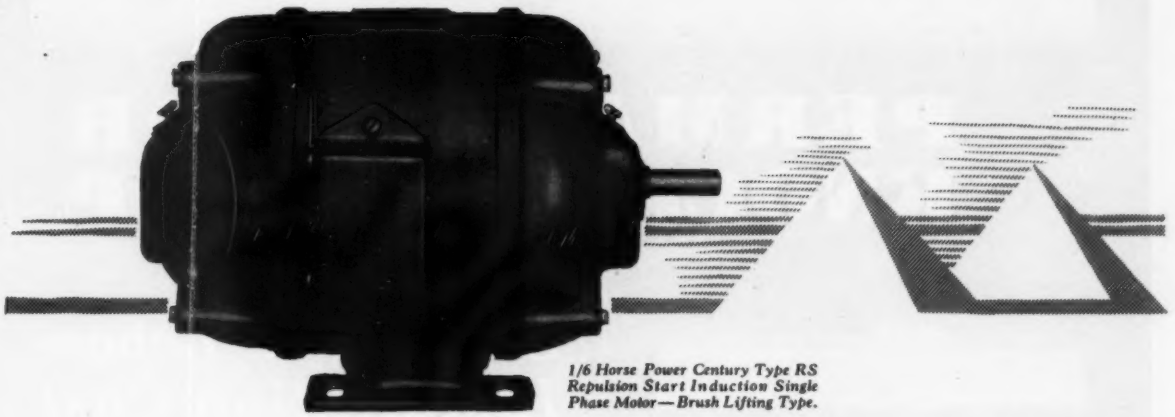

1/6 Horse Power Century Type RS Repulsion Start Induction Single Phase Motor—Brush Lifting Type.

Meeting the Tests of Time!

In all parts of the world, in all classes of service, under all operating conditions Century Single Phase Motors have always met these tests:

1 The *rigid inspection tests* of your designing engineers.

2 The *operating tests* of your motorized equipment before it is sold.

3 The *sales tests* of your distributors, dealers and salesmen.

4 The *satisfaction tests* of users of Century driven equipment.

5 The *tests of time* . . . 1903—1933.

Investigate thoroughly the profit advantages of Century Motors—they will meet *your* tests and *your* requirements. Century Engineers will extend every help to assure the proper selection and application of motors to your product.

Century MOTORS

CENTURY ELECTRIC COMPANY · 1806 PINE STREET · ST. LOUIS, MO.
Offices and Stock Points in Principal Cities

33-1/6

ALTERNATING AND DIRECT CURRENT, SINGLE PHASE, POLYPHASE, SPLIT PHASE, MULTISPEED AND SPECIAL MOTORS, RANGING IN SIZE —DEPENDING ON TYPE—FROM 1/60 TO 600 H.P.— GENERATORS—MOTOR GENERATOR SETS—ACTODECTORS—BATTERY CHARGERS, FANS, ETC.

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PERMAFLECTOR KNOCK-OUT STRIP

(Patent Pending)

Saves Time-Labor-Installation Cost

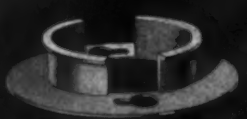
2. Socket as it appears when in place

1. Merely knock out desired opening, insert socket and turn

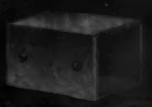
3. Screws for attaching holder, also lock socket in place

Knock-out joint—any angle from 65° to 180°

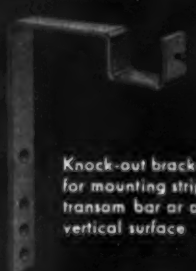
Knock-out end (also joint and coupling) firmly fastened by set screws



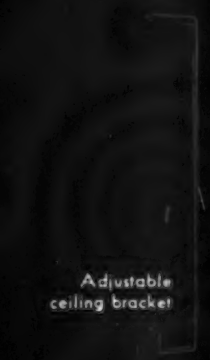
Fitter—provides holder groove



Knock-out coupling



Knock-out bracket—for mounting strip on transom bar or other vertical surface



Adjustable ceiling bracket

A wiring conduit for the rapid installation of any type of commercial reflector. Requires but little cutting; no punching; no drilling. Hacksaw and screwdriver only tools required.

Strip consists of two trough members, back and face, telescoping, the face containing the knock-outs, spaced 3″ on centers, 1 27/32″ square.

To assemble: Merely knock out the opening desired, insert knock-out socket in opening and turn; two screws in knock-out socket for attaching holder, when tightened lock socket in place. Back member being removed, exposing binding screws of sockets, makes wiring easy.

Sockets can be inserted in only one way, automatically fixing the polarity and lining up the conductor connections.

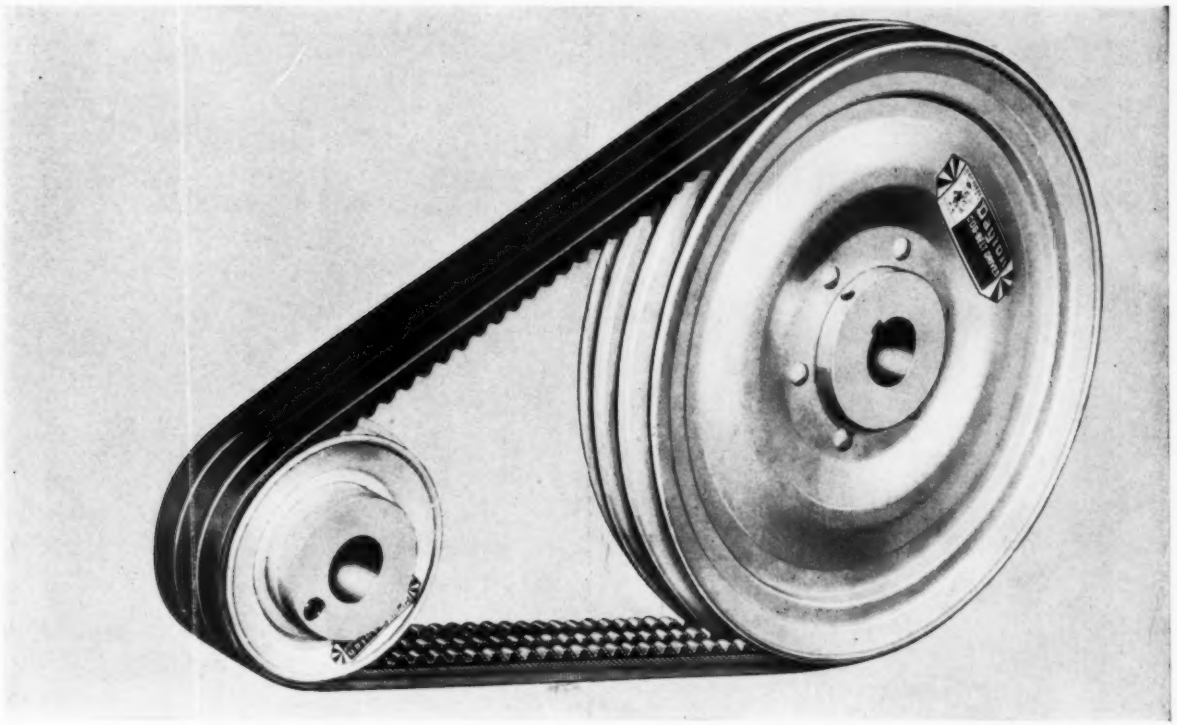
Flexible joints, ends, couplings, fixed firmly in position by means of set-screws.

Write today for complete particulars. Learn for yourself how it simplifies reflector installation problems.

PITTSBURGH REFLECTOR COMPANY
Oliver Bldg. Pittsburgh, Pa.

Knock-out "U" strap—for mounting to ceiling or other horizontal surfaces

Now available EVERYWHERE



Complete stocks of Day·Steel Pulleys and Dayton Cog·Belts

Immediate delivery service on Day-Steel Pulleys and Dayton Cog-Belts is now available to practically all electrical contractors from more than thirty complete stocks, located in the important industrial centers. This gives the contractor recommending Day-Steel Pulleys and Dayton Cog-Belts an unusual opportunity to get the bulk of the drive business in his territory.

These drives offer new economy—new efficiency and new standards of performance because Day-Steel Pulleys are—

—*from 30% to 50% lower in price*—offering *tremendous savings* in initial cost and in maintenance expense.

—*accurately formed* from heavy-gauge pressed-steel, strongly welded both at the rim and at the web—assuring *maximum strength and ruggedness* with a substantial *reduction in weight.*

—*rigidly assembled* with a hub of unique design—providing *true running* and *accurate balance.*

—*finished* in high quality aluminum—providing *complete protection* and *outstanding appearance.*

—*made with 1 to 6 grooves*—for all ratings of 7½ h.p. and below—all speed ratios—all center distances.

And for greater convenience, these new Day-Steel Pulleys are individually packaged, and include interchangeable bushings for any size bore.

No other drive can offer distributors and contractors such an unusual opportunity to increase their business—but why not get the complete story—fill in and mail the coupon below or write for Bulletin No. 110, and the location of the stock of Day-Steel Pulleys and Dayton Cog-Belts nearest you.

THE DAYTON RUBBER MFG. CO.
DAYTON, OHIO

Factory Distributors in Principal Cities and all Westinghouse Electric and Manufacturing Co. Sales Offices

Dayton
COG-BELT DRIVES

THE DAYTON RUBBER MFG. CO., Dayton, Ohio.

Gentlemen: Please send me all the facts about Day-Steel Pulleys used in connection with Dayton Cog-Belts and the location of the nearest complete stock.

Name of Firm.....

Street Address.....

City and State.....

By.....

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ANNOUNCING 2 NEW GE CONVENIENCE OUTLETS

G-E COMBINATION CLOCK HANGER OUTLET

This new outlet, providing mechanical support for clock is installed behind the clock, concealing electrical connection. Recessed box stores about 2 feet of cord. Clock hangs flat. G-E Clock Hanger Outlets have easy-finding slots, body of Textolite with plain face and one-piece self-aligning contacts of phosphor bronze.

For further information see your nearest G-E Distributor or write to Section D-202, Merchandise Department, General Electric Company, at Bridgeport, Connecticut.

G-E OUTDOOR FLUSH RECEPTACLE

Permanent weather-proof single convenience outlet for outdoor appliance or lighting connections. Extra-heavy cadmium finish, highly resistant to rust, this new G-E Outdoor Receptacle can be mounted flush on the outside of a building. Metal screw cover with rubber bushing through which cord or leads are passed, make connections completely weather-proof. Protective screw-cap, attached by chain to plate, closes outlet opening when device is not in use.

GENERAL ELECTRIC

WIRING DEVICES

MERCHANDISE DEPARTMENT, GENERAL ELECTRIC COMPANY, BRIDGEPORT, CONNECTICUT

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